CYCLICAL FLUCTUATIONS

Retail and Wholesale Trade
United States, 1919-1925

BY

SIMON S. KUZNETS, Ph.D.

Prefatory Note by
WESLEY C MITCHELL

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PREFATORY NOTE

FROM the beginning of their efforts to explain business
crises men have speculated much about the rôle played by
"consumption." In the early nineteenth century, when the
factory system was spreading from one industry to another,
many investigators held that "power to consume" was ex-
panding less rapidly than "power to produce." For this
reason, they said, markets became "glutted" every few years
with goods which people had made, but could not buy
Whether they diagnosed the trouble as "under-consumption"
or as "over-production" was a matter of phrase making.

This problem has not lost its interest in the hundred years
since Sismondi and Malthus discussed it. In modern theories
of business cycles one of the critical points is to account for
the recurrent development of paradoxical conditions in which
the community seems to suffer want because it has produced
superabundant wealth. Many explanations have been offered.
Oversaving, ill-balanced investments, the long period re-
quired for the building of industrial equipment, changes in
the purchasing power of different classes produced by the
expansion of bank credit, "competitive illusion," the di-
minishing utility of additions to the supply of consumers'
goods, a deficiency of incomes disbursed in comparison with
the value of goods sent to market—these catchwords may sug-
gest some of the hypotheses which, singly or in combination,
have their advocates at present.

All of these explanations are plausible, and perhaps no two
are incompatible with each other. But our knowledge of
business cycles is most unsatisfactory so long as it consists
of an unsystematized collection of hypotheses which are plausi-

ble rather than proven. The present need is for testing every explanation to find how well it accords with the relevant facts. Such testing requires close study of the inter-relations among the fluctuations of all the processes involved. To study these inter-relations closely, we must have measured observations, covering a wide range of activities, made at brief intervals, and continued for periods long in proportion to business cycles.

Hence the theoretical significance of the recent progress in compiling and analyzing economic statistics. A decade ago we could compare the fluctuations of prices of commodities at retail and wholesale, of raw materials, producers' and consumers' goods, of stocks, and of labor, we had statistics concerning the output of certain staples; our data relating to railway transportation, imports and exports, the currency, banking, clearings, discount rates, bond yields and bankruptcies were relatively abundant, and we had fragmentary returns regarding numerous other processes. But concerning the process which is supposed to control all business operations in the last resort—the process of distributing goods to consumers—we had scarcely any reliable data And at that time the technique of analyzing time series in such fashion as to segregate cyclical fluctuations from secular trends and seasonal variations, and of measuring the relations among the cyclical fluctuations of different processes, had been applied to but few series

Within the past ten years, this technique has been improved in various ways and used widely. Not less important are the accessions to the list of economic processes covered by statistics. We now have index numbers not only of prices, but also of physical production and volume of trade; data concerning employment have been substituted for percentages of men out of work, and supplemented by pay-roll disbursements; our manufacturing censuses are taken every two instead of every five years; we have gained our first dependable

knowledge of the turnover of deposits subject to check; we have better estimates of annual income. This list is far from complete; but it is safe to say that among all the accessions none is more valuable to men of affairs and economists than the data concerning volume of sales at retail and wholesale, which the Federal Reserve Banks have been gathering month by month since 1919.

Supplied with all these new data, and equipped with a more powerful technique, the students of business cycles can attack their old problems with better chances of success than their predecessors enjoyed. But such work calls for a combination of interests and of skills which is rare. A few writers upon the theory of business cycles have made statistical inquiry an organic part of their work—notably Professors Henry L Moore and Alvin H. Hansen—, but most theorists content themselves with occasional citations of simple tables and charts Few of the business-cycle statisticians, on the other hand, exhibit an interest in theoretical issues. There is need of workers like Dr. Kuznets, who uses analytical methods to make an especially significant body of new data yield insight into a problem which has been debated with little gain for more than a hundred years

The data concerning the sales of department stores, chain stores of various kinds, mail-order houses, and wholesale establishments, which the Federal Reserve Banks began to collect in 1919, were interesting to business men from the first month of publication. But the reports had to accumulate for several years before they could show much about business cycles. Even now that they cover two cycles, the conclusions which they suggest must be regarded as tentative. Yet the process to which they relate is so fundamental that we should inquire without more delay what they can teach us.

Dr. Kuznets is the first to essay this task at large. He has eliminated the secular trends and seasonal variations of his series as best he could with materials covering but a few years.

He has divided the dollar-volume of sales by appropriate index numbers to approximate changes in the physical quantities of goods distributed. He has compared retail sales with wholesale, and both with manufacturing output, so far as the data permit. He has gone back to the disbursement of incomes of various types to consumers And he has faced the difficult problem of accounting for the differences in the cyclical fluctuations which seem to be characteristic of these several processes—the flow of incomes to individuals, the manufacture of consumers' goods, purchasing by retailers, and purchasing by consumers

Explorations of new territory, conducted with spirit and skill, are fascinating ventures, whether the areas covered be barren or promising. Any one who follows Dr. Kuznets' trail will gain for himself some of the pleasures of discovery For those concerned with retail or wholesale trade, there must be much in this record which an economist sees but dimly. For men interested in the study of business cycles I can speak more confidently Dr Kuznets' investigation is the type of work which stimulates scientific activity :—it shows us how to deal more efficiently with a fundamental problem.

WESLEY C. MITCHELL.

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INTRODUCTION

THE present essay deals with the problem of cyclical fluc-
tuations in business activity. It is an attempt to make use
of the new data on sales and output for the United States
which have become available since January, 1919. These data
are first surveyed with the emphasis placed on the cyclical
element in the series. In this survey certain tentative con-
clusions are reached, and the argumentative part which
follows attempts to explain the nature and significance of
these conclusions.

Before we survey the statistical series it would be advisable
to recite briefly the peculiar features of the cycles that took
place in the United States during the years 1919-1925. That
will serve to keep in mind the specific conditions which have
influenced the character of the data to be used.

During the six years, 1919-1924, the United States passed
through one violent and one moderate business cycle. After
a temporary span of hesitation and decline, immediately after
the Armistice and continuing on the whole through the first
quarter of 1919, prices, sales and production began to rise.
The rate of increase was comparatively great, and the phe-
nomena usually accompanying a period of cumulative pros-
perity developed rapidly and forcefully. It is possibly due
to this fact that the whole period turned out to be of a
shorter duration than the average.

The decline began at varying times in different branches
of business activity. In some it started in November, 1919
(sales of shares on the New York Stock Exchange), in others
in January, 1920 (sales by wholesalers, commodity volume),

in others still later. Mr. Snyder's index of the volume of trade shows the highest point in July, 1919, but a perceptible decline begins only in April of the year following.[1] At any rate it can be said that in the second half of 1920 the phenomena of the period of depression were already in full sway

The decline continued on the whole up to and throughout July, 1921.[2] Thus the first post-war cycle took place during the short period of 28 months, from April, 1919, to August, 1921 The conditions in which this cycle developed were peculiar in the following respects (we note only the most important ones) :

(1) There was a well-developed inflation with the currency and credit conditions facilitating speculation all through 1919. Accordingly, the deflation that began in 1920 and continued through 1921 was rather severe

(2) The demand of ultimate consumers, domestic as well as foreign, was abnormally strong

(3) The industrial system of the country was in a somewhat rundown condition, especially in regard to the railroads and the coal mines. The human element in industry and trade was not in a state which would make for increased efficiency, this being true both in respect to the laborers and the managing personnel.

(4) It was a post-war period, and this meant that the country's economic system must change from satisfying of war-time demands to meeting those of peace. The fluctuations in business were taking place in the conditions of a period of reconstruction.

[1] See the *Journal* of the American Statistical Association, December, 1923, p 962

[2] Cyclical fluctuations in the rate of business activity do not come simultaneously in all the various compartments of the economic system of the country, and thus cannot be pinned down to definite time limits Any unqualified fixing of such limits is therefore arbitrary and tentative.

As a result of these peculiarities the first post-war business cycle seems to be exceptional in the following respects.

(a) The fluctuations in prices and the dollar volume of business activity were violent, great changes taking place in a very short time.

(b) The consumers' goods, trades and industries took the initiative in the recuperation of activity after the short slump that immediately followed the Armistice. The same groups led in the recession and the recovery.

(c) As compared to the price and the dollar volume fluctuations, the changes in commodity volume were not large. But the latter were probably larger than they would have been in a cycle marked by smaller and more gradual changes in price

The developments beginning with the second half of 1921 are not as clear cut as those during the preceding two and a half years The revival which started in the different branches of business activity at various times during 1921 (in some even at the end of 1920, in others only in the beginning of 1922) was developing on the whole continuously up to and throughout the first quarter or half of 1923

There was, however, no sustained depression following these two years of continuous rise in the volume of business activity There was, indeed, a decline through a half of the year 1923, this period covering different months in the various branches of business But this was followed by a considerable rise of the dollar volume series during the first two months of 1924, a rise which in several of the indices reached a point higher than any in 1923 (in the dollar volume of sales by wholesalers, number of shares sold on the New York Stock Exchange). True, there came again a well-defined decline in the second quarter of 1924, but on the whole no well-marked depression can be said to have taken place in 1923-24.

The developments during 1921-24 might be tentatively

called the second post-war business cycle   The conditions in which the latter took place were peculiar in the following respects:

(1) There was a strong impression left on the business community of the bitter experience of the 1920-21 depression. The business men were inclined to be less daring in buying ahead, the bankers and the Federal Reserve System were more ready than ever to check any expansion of loans that looked like the beginning of another period of speculative increase of prices.

(2) While the first post-war cycle left unsatisfied a certain volume of demand for durable goods, as the need for buildings or the lack of equipment on the railroads, the industrial system of the country was in a state to take good care of this demand.   On the other hand, exports decreased considerably and hence the burden of supplying foreign consumers became much lighter.   As a result, the industrial apparatus of the country was in a condition well suited for a prompt response to any increase in demand which might take place.

Due to these two circumstances the cyclical developments during 1921-24 were of a rather attenuated character, presenting in this respect a contrast to the first post-war cycle. This seems to be true for the movements of both dollar and commodity volume of business activity.

As shown by most of the reliable business indices, the second post-war cycle terminated in July, 1924, and after that the country entered upon a new period of rise.   While this rise was not carried on in sustained fashion through the year 1925, at the end of the year the business conditions were still in the prosperity phase of the cycle.

CYCLICAL FLUCTUATIONS

CYCLICAL MOVEMENTS IN THE DOLLAR VOLUME OF SALES BY
RETAILERS AND WHOLESALERS

(U. S , 1919-1925)

PERIODIC statistical data on retail and wholesale trade in
the United States are collected by the Division of Analysis
and Research of the Federal Reserve Board. The *Federal
Reserve Bulletin* publishes over nine series on the dollar
volume of sales, by as many groups of retailers, monthly, be-
ginning with January, 1919, and over five series of similar
data on sales by wholesalers It is our task at present to
survey these indices in order to learn whatever we can of the
topic of our interest, the problem of cyclical fluctuations in
the distributive trades.

With this specific problem in view one is likely to approach
the survey of the data with the following questions: (1) Are
there any cyclical fluctuations in the volume of business ac-
tivity carried on by retailers and wholesalers? (2) If there
are, how do these movements in retail sales compare with those
in sales by wholesalers and in other branches of economic
activity? In the comparison called for by the second ques-
tion two points must be covered: (a) the comparison as to
simultaneity, lag, or precedence; (b) the question of the
comparative amplitude of the fluctuations.

The data at our disposal are index series representing the
dollar volume of sales by months in a varying number of
business enterprises In their original form these monthly
indices described not only the cyclical fluctuations, but also

the changes due to the long-time growth of the enterprises reporting, the variations due to the influence of seasons, and changes of a random character. It was advisable then to apply some method of statistical analysis to the series in order to separate them and adjust for fluctuations other than cyclical Such an adjustment was particularly desirable in view of the fact that in the series under consideration the seasonal and the long-time elements were comparatively substantial.

Detailed explanation of methods of analysis used and of reasons for their choice is given in an appendix.[1] A brief mention will suffice here. The secular trend, i.e , the formula describing the long-time changes, was in all cases taken as a straight line, that is, as an equation of the first degree It was fitted by the method of least squares, and eliminated through expressing every showing of the original index in terms of the corresponding showing of the secular trend, the latter being taken as one hundred The index of seasonal variations for sales in retail trade was computed by the Division of Analysis and Research of the Federal Reserve Board by the method of link-relatives, and the series were corrected for the seasonal element by dividing the original data by the index The index of seasonal variations in sales by wholesalers was determined by the method of ratio-ordinates.

These computations when completed were for series covering 67 months, the period from January, 1919, to July, 1924. In order to take account of the new data, a separate trend was computed for the 17 months, August, 1924, to December, 1925. (For details, see appendix to this chapter) Thus the indices as given below allow of exact comparisons only within each of the two periods In most cases, however, a rough comparison can be made through the whole period covered.

The series given below are supposed to represent only the

cyclical and the random fluctuations in the volume of sales by retailers and wholesalers. It is obvious, however, that with the short period of time covered by the data used one would be more than careless to assume that the series after the adjustment do not contain any elements of a seasonal or growth character. We must interpret the final showings cautiously and avoid making use of too nice distinctions, since the accuracy or rather inaccuracy of every individual item of the series does not warrant them   With this warning in mind let us survey the different indices.

Groceries

For this most important branch of retail trade the Federal Reserve Board collects and publishes data on the dollar volume of sales by months in 28 chain store systems, which operated about 17,000 single unit stores in 1923 and had total sales for this year to the extent of 637 millions of dollars[2] By taking the average monthly sales for 1919 as 100, and adjusting the series as described above, we get the index on page 4.

It will be easier to study the index if its fluctuations are represented graphically   On the chart on the following page the same series is represented by the heavy black line.

It is interesting to compare these movements in retail sales of grocery products with the changes in the volume of sales by wholesale grocers   These are being given in index form by the Federal Reserve Board for 303 wholesale firms whose volume of sales in 1923 was about 560 millions of dollars[3] The series runs as follows (see page 5) ·

[2] The original data are from the revised index by the Federal Reserve Board, not published fully but available on request   Number of chain systems after July, 1924-27
[3] The original index of this and all other following series of sales by wholesalers were taken from the following sources   Jan , 1919-June, 1922, *Federal Reserve Bulletin,* April, 1923   July, 1922-July, 1924, from the same source, as the series appeared with the final corrections

1. SALES IN 28 GROCERY CHAIN SYSTEMS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	92	112	96	92	99	106	107
February	91	114	96	92	102	108	104
March	90	118	92	93	110	96	99
April	91	129	89	91	100	105	107
May	95	128	89	93	108	109	106
June	90	130	89	94	106	103	105
July	97	129	83	90	100	104	110
August	94	117	89	92	101	95	104
September	93	115	87	94	102	99	104
October	102	109	89	90	102	104	123
November	99	107	90	97	105	101	107
December	103	102	95	98	101	105	125
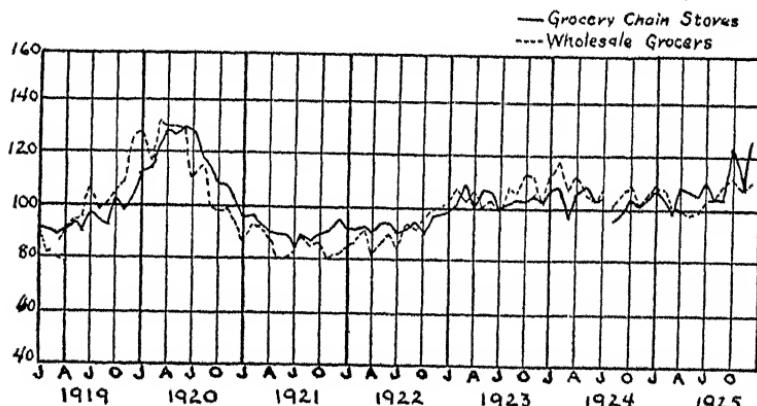
1. Sales by Retail Grocery Chain Stores and by Grocery Wholesalers, Dollar Volume, 1919-1925

Summarizing briefly the evidence of the data surveyed, we can say that·

(1) For the period covered there were definite cyclical fluctuations in the dollar volume of sales by both retailers and wholesalers in the grocery trade.

2. SALES BY WHOLESALE GROCERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	89	127	87	83	101	112	110
February	81	117	94	85	107	118	108
March	84	133	93	91	103	107	101
April	90	133	87	81	105	112	100
May	96	131	80	85	100	106	98
June	97	131	80	90	103	103	99
July	107	131	82	84	98	107	103
August	98	111	90	94	108	100	104
September	101	116	85	92	107	106	109
October	104	100	86	96	113	109	112
November	109	99	80	99	112	102	107
December	125	95	81	100	102	106	110

(2) There was a close correspondence between the movements of the two, in some of the cases perfect simultaneity, in some a lag of one month by the retail sales behind the wholesale.

(3) The fluctuations in wholesale sales were greater than in the retail The standard deviations for the 84 months are 13.2 and 10.5 respectively (14 4 and 10 7 for the first 67 months).

Department Stores

According to the survey by the Comptrollers Congress of the National Retail Dry Goods Association of sales in 300 department stores for 1923, the sales of the apparel departments in 44 of the most representative stores formed about 70 per cent of the total dollar volume of net sales, the remainder being divided among house furnishings, musical instruments, drugs and toilet articles, jewels and jewelry, groceries (a very insignificant percentage), and other articles.[4]

[4] *National Retail Dry Goods Asso. Confidential Bulletin,* Dec., 1924, p 25

In the case of department stores we have a demand for goods entirely different from those of grocery chains. The latter sell food, the object of a regularly recurring daily demand which does not allow of substantial variations. But a department store is visited only from time to time by an act of deliberate ''shopping,'' and sells goods whose purchase is made only several times during the year, the demand for which is variable. An article of apparel is uncertain in its wear, can be made to last longer or again may be discarded quickly for a new one.

How then did the sales in department stores move as compared to sales in groceries? The Federal Reserve Board publishes an index of the dollar volume of sales by months in 359 department stores located all over the country, having the total volume of sales for 1923 as of 1,487 millions of dollars [5] This series runs as follows:

3 SALES BY 359 DEPARTMENT STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	90	114	106	90	98	102	97
February	91	110	106	91	98	104	102
March	87	112	104	88	104	93	94
April	95	109	100	96	98	105	103
May	91	112	97	96	103	99	96
June	90	111	98	94	105	97	97
July	99	116	96	92	99	98	99
August	96	110	95	97	106	94	96
September	99	109	92	102	102	104	103
October	97	105	96	98	107	98	111
November	100	111	94	99	103	99	99
December	101	104	94	100	103	103	107

On the chart on page 7, this index is represented by the solid black line.

[5] The original index used is the latest revised by the Federal Reserve Board, not published fully anywhere, but available on request

While these cyclical changes are fairly similar (*r* for 59 mos + 838) there seems to be one significant difference between the movements of the sales in department stores and those in groceries   The fluctuations in these latter have been much greater than in the former, especially so during the years 1919-1920.   The standard deviation of the department

—Wholesalers in 4 Branches of Trade
---359 Department Stores
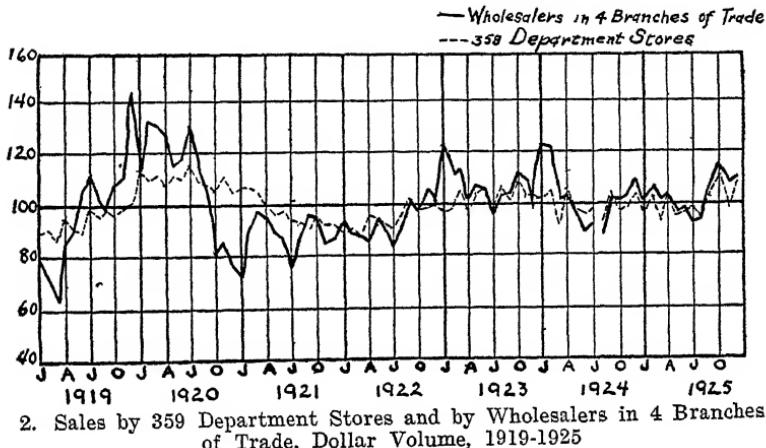
2. Sales by 359 Department Stores and by Wholesalers in 4 Branches of Trade, Dollar Volume, 1919-1925

store sales index is 6.3 as compared to 10 6 for the grocery series.

A cause of this latter difference might be looked for in the different character of consumers' demand in these two branches of retail trade.   The demand is probably more variable in the case of department stores, and when the prices go up a substantial decline in the physical volume of goods bought might result.   Low prices would have an opposite effect   With this movement of prices and physical volume of sales in opposite directions, the dollar volume of sales during prosperity will not rise too high, or on the decline will not fall too low.   In groceries on the other hand the rise of prices does not serve to check so much the physical volume of goods bought, nor does a decline of prices make

for a greatly increased purchasing, and thus there is no check upon the rise and decline in the dollar volume of sales. How true this explanation is could be ascertained later in the study of fluctuations in the physical volume of sales.[6]

It is interesting to compare the movement of sales in department stores with the movements in the volume of sales by wholesalers. For the purpose of this comparison we combined the series of sales by dry goods, drugs, hardware and shoe wholesalers, giving each of them a weight corresponding to the percentage of net sales which the respective product assumes in the department store sales totals.[7] The weights used were: dry goods, 82; hardware, 7; shoes, 7; drugs, 4. The index thus computed follows:

4. SALES BY WHOLESALERS IN 4 BRANCHES OF TRADE

(Dollar Volume)

	1919	1920	1921	1922	1923	1924	1925
January	79	158	73	93	122	122	101
February	71	134	89	90	113	121	106
March	63	130	98	89	114	101	101
April	84	126	96	86	103	103	102
May	91	115	90	95	106	96	97
June	104	118	88	90	106	89	98
July	114	131	76	84	97	91	93
August	103	113	86	93	103	88	94
September	98	101	96	101	103	102	103
October	109	80	95	97	113	101	116
November	112	84	84	105	110	103	109
December	144	77	87	100	99	110	109

This index is a combination of four indices, each one of them already adjusted for the secular trend and the seasonal element.

Here again we see that:

(1) The movements in the index of sales by wholesalers either precede or are simultaneous with the movements in the sales by retailers. The former is conspicuously the case in the decline of 1920 and the recovery of 1921.

[6] See infra, Chapter 2.
[7] Data from the same survey by the National Retail Dry Goods Association. See note 5.

(2) The index of sales by wholesalers is subject to greater fluctuations than the index of sales of retailers. In the second half of 1919 and the first of 1920 the former rises far above the latter, and then declines far below it. The standard deviation of the series of wholesale sales in this case is 15.8 as compared to 6 3 for that of the retail sales index (17.3 and 6.7 for the first 67 months)

Dry Goods

Sales by dry goods chain stores are being published for four chain systems having 576 single stores (June, 1924). The distinctive characteristics of the kind of goods sold in these stores is the listing of most of them at fairly low prices. It includes little of the higher priced ready-made goods or materials sold in department stores or shops of a more exclusive character.

The series of sales runs as follows:

5 SALES IN DRY GOODS CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	103	105	123	86	95	135	98
February	108	100	123	97	102	114	105
March	103	102	119	89	109	102	101
April	107	104	108	97	95	109	106
May	112	125	104	95	104	109	101
June	103	122	107	92	105	99	100
July	106	132	111	91	94	101	99
August	113	126	104	90	100	96	106
September	103	121	93	90	100	90	97
October	108	121	99	94	105	95	119
November	104	118	96	101	107	112	106
December	97	112	94	105	120	114	125

The month-to-month breaks and changes in retail sales appear so haphazard that an observer might suspect them to be a result of statistical manipulations of the original data,

rather than a reflection of the real situation. But one is led
to have more confidence in the data when it is seen that most
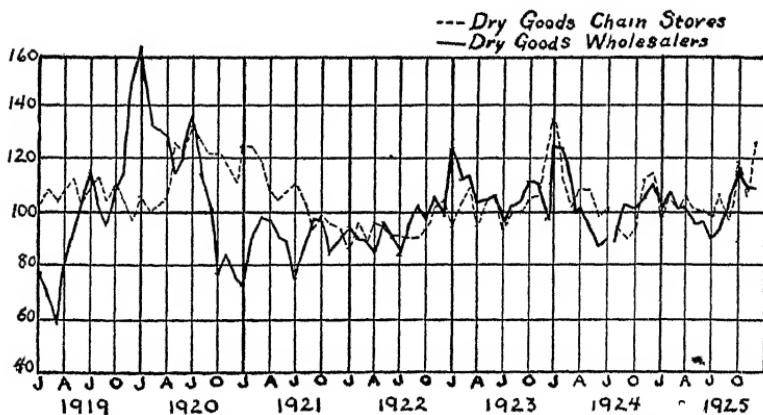
3. Sales by Dry Goods Chain Stores and by Dry Goods Wholesalers,
Dollar Volume, 1919-1925

6 SALES BY DRY GOODS WHOLESALERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variation

	1919	1920	1921	1922	1923	1924	1925
January	77	163	72	96	123	124	101
February	67	134	90	92	114	123	107
March	59	131	99	90	115	100	102
April	80	128	98	86	103	101	101
May	90	115	91	96	104	94	97
June	105	120	89	90	105	87	97
July	114	135	76	83	95	89	91
August	102	114	86	94	102	88	93
September	95	100	98	102	103	103	102
October	108	77	97	98	113	101	117
November	114	83	83	106	110	104	109
December	149	76	88	99	97	110	107

of the ups and downs shown are repeated in a series of sales
by wholesalers, a series collected independently and analyzed
statistically without any bias as to a future comparison   The

reference here is made to the index of sales by 101 dry goods wholesale firms, which had total sales in 1923 of 287 millions of dollars   This series is shown in Table 6.

Here again as in the comparisons made heretofore the wholesale index either preceded the retail by a varying amount of time, or at most was simultaneous with it.

Another observation is true in the case of dry goods. The index of sales by wholesalers was again subject to greater fluctuations than the index of retail sales. This observation seems especially applicable to the first two years and a half, i.e., to the first post-war business cycle. The standard deviation for the retail series is 11.5 as compared to 16.5 for the index of sales by wholesalers (12 2 and 18.5 for the first 67 months).

Shoes

The case of shoes is peculiar in that the stores which sell shoes confine themselves almost exclusively to this single commodity and its auxiliaries. In the cases before surveyed we had stores selling a great variety of products   Aside from this peculiarity of concentration there is no reason to expect a different picture for the case of shoes, since the demand for the commodity seems to be of the same nature as that for other articles of apparel.

The series published by the Federal Reserve Board describes the dollar volume of sales in 6 chain systems which had 365 single stores in operation in January, 1924, and total sales for 1923 to the amount of 35 millions of dollars [8]   When corrected in the usual way the index presents the picture as shown on page 12.

It should be noted that large changes of a seasonal char-

[8] This and all the following indices of retail sales were taken in their original form (corrected for seasonal variations only) from the following sources Jan , 1919-Dec , 1922, *Federal Reserve Bulletin*, Jan , 1921, p 20, Jan , 1923-Dec , 1923, *Federal Reserve Bulletin*, July, 1923, p 580, Jan , 1924-July, 1924, *Federal Reserve Bulletin*, Dec , 1924, p. 956, Aug , 1924-Dec , 1925, *Federal Reserve Bulletin*, February, 1926, p. 114

7. SALES IN SHOE CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	89	112	105	94	93	104	106
February	86	104	108	101	88	105	112
March	77	116	125	88	119	93	95
April	87	102	99	106	88	121	113
May	86	112	100	90	101	102	96
June	84	108	102	95	110	104	105
July	88	116	87	92	91	96	99
August	121	107	90	90	98	105	113
September	108	106	91	105	107	98	99
October	103	112	98	89	99	93	106
November	107	108	90	92	97	101	92
December	97	103	95	104	104	107	104

acter are still contained in the data. This is due to the fact that Easter Sunday shifts from March to April and therefore its influence is not eliminated by the fixed index of seasonal variations. Hence whenever Easter falls in March, the index showing for March is excessively high with the showing for April correspondingly low. For the years covered by the series Easter Sunday distributed itself between the two months as follows:

1919	April 20
1920	April 4
1921	March 27
1922	April 16
1923	April 1
1924	April 20
1925	April 12

With the aid of this small table, one looking at the chart (on page 13) can locate easily the ups and downs due to this accidental factor in the smooth run of the index.

We are able to compare the movement in the retail sales of shoes with the movements in the wholesale sales of the same commodity. Data on these latter are given by the

Federal Reserve Board in an index covering sales by 58 wholesale firms located in six Federal Reserve Districts and
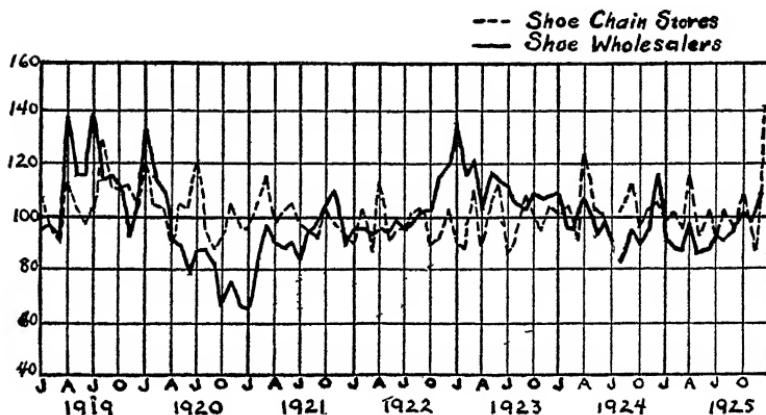
4. Sales by Shoe Chain Stores and by Shoe Wholesalers, Dollar Volume, 1919-1925

having sales for 1923 to the amount of 107 million dollars. The series runs as follows:

8. SALES BY SHOE WHOLESALERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	71	143	64	80	126	116	99
February	77	147	80	88	117	110	100
March	70	134	97	83	119	103	96
April	108	117	87	83	102	122	109
May	95	115	82	85	120	107	99
June	107	94	84	90	118	104	102
July	133	99	73	83	109	100	101
August	125	99	84	88	109	82	105
September	135	89	89	93	106	94	110
October	129	73	90	94	114	92	116
November	106	75	97	107	114	101	115
December	121	66	77	112	114	123	128

The observation made in other cases also holds true here. In its peaks, troughs and the general movements the index of volume of wholesale sales tended to precede the index of sales by retailers. But it must be noticed that while the sales by wholesalers reflect the cycles clearly, the retail sales do not show any definite cyclical fluctuations after 1921

The standard deviation for the series of wholesale sales is 18.1, while that for the retail series is 9 6 (19.4 and 10.1 for the first 67 months). An inspection of the chart shows that on the rise the dash line rose above the heavy one, and the decline fell below it. Thus again the cyclical fluctuations in sales by wholesalers were more marked than those in the retail sales. The difference was greater for the years 1919-1921 than for the subsequent two and a half years.

Drugs

The drug chains are really a type of department store A modern drug store sells not only drugs, patent medicines, and all kinds of instruments for medicinal use, but also candies, stationery, toilet articles, cigarettes, soda-fountain goods, and sometimes lunch-counter products. The demand for all these commodities is somewhat different in nature from the demand for food and apparel It is either an emergency demand, as in case of the drugs and medical articles, or a demand for goods which, although not strictly necessary, form a permanent part of the consumer's fixed habits of life. In both cases the demand is not very variable A man could hardly be prevented from buying the necessary medicine because of a rise in price. Nor could one expect customers to be responsive in the physical volume of their demand for sodas, tooth paste, shaving cream, or face powder to a change in price, since each of the many articles is of small money value but of great importance in the daily routine.

This fixed character of demand should not be understood

to mean that cut prices have no appeal to the patrons of drug stores They may be effective in causing the consumer to prefer one particular store to another, but only in a few cases will it make him buy an additional number of units. True, drug stores carry quite a number of articles of luxury, as expensive perfumes and the like, but the bulk of the goods is either of the emergency or of the fixed, ordinary convenience type, the demand for which does not vary to any considerable extent.

The Federal Reserve Board publishes an index of the dollar volume of sales in 10 drug store systems, which operated 520 stores in January, 1924, and had total sales in 1923 to the amount of 6 8 million dollars. The series runs as follows:

9. SALES BY DRUG CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January . . .	95	109	103	94	97	99	102
February .	91	108	103	98	100	101	101
March	95	107	105	96	103	99	99
April .	95	102	105	95	99	100	102
May	93	107	102	97	102	102	103
June .	92	107	102	96	107	97	104
July	96	109	100	94	98	97	100
August	97	106	97	96	101	98	104
September	94	107	98	97	101	95	104
October .	96	106	98	97	103	100	105
November	103	105	98	96	103	98	106
December	103	105	95	97	104	97	108

This table is illustrated by the chart on the following page.

The chart reveals the fact that cyclical fluctuations are present in· the series only in a very attenuated form. The standard deviation for the drug chain sales is 4.4, the smallest we have yet encountered. The cause of this evenness of movements may lie, first, in the fixed character of demand, i.e., in the evenness of the physical volume of goods

demanded; secondly, in the comparative stability of the prices of articles sold in drug stores. The widely advertised patented medicines and toilet articles, and the soda-fountain goods are being sold at approximately the same prices in times of prosperity and depression. At any rate we do not find the same variability of prices as in cases of groceries and apparel. This circumstance, combined with a stable physical volume of de-

5 Sales by Drug Chain Stores and by Drug Wholesalers, Dollar Volume, 1919-1925
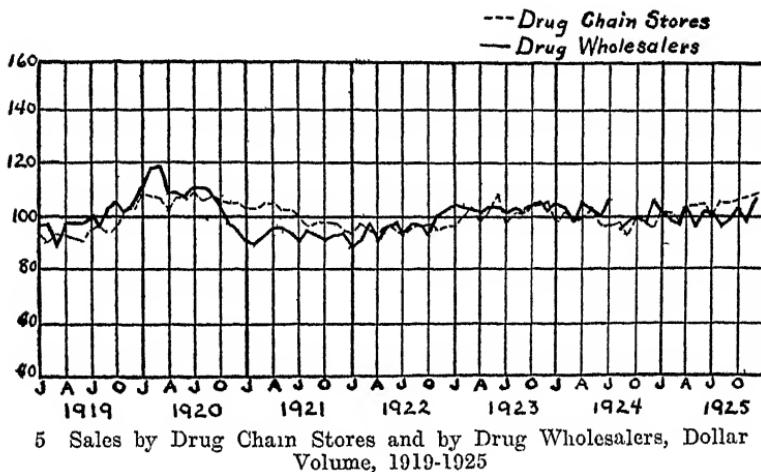
mand, accounts for an even run of the dollar volume of sales.

The movements of sales by retail drug stores are now compared with those of sales by drug wholesalers. The index of these latter, given also by the Federal Reserve Board, covers 58 wholesale firms located in seven Federal Reserve Districts and having total sales for 1923 to the amount of 105 million dollars. In the table on page 17 we quote the index.

In the comparison of the retail and wholesale sales series we find again substantiated the observations made in the preceding cases. The movements of the wholesale series developed before those of the retail sales index. Although it is hard to establish the case here by comparing peaks and troughs, a glance at the chart will reveal that the rise in

10 SALES BY DRUG WHOLESALERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January .	97	112	90	88	105	106	102
February	97	118	89	92	103	104	99
March	88	118	93	98	103	99	97
April	97	108	96	91	101	107	103
May . .	98	108	94	96	104	105	96
June . ..	97	106	94	98	104	100	101
July	100	110	91	93	102	106	101
August . . .	96	110	96	97	103	95	94
September . .	103	107	94	94	102	99	99
October	107	105	90	92	105	100	103
November .	101	98	92	100	106	99	98
December .	106	96	93	103	101	107	106

1919-20 began in the wholesale sales series much earlier than in the retail; that the former started to decline in 1920 before the latter Similarly, the revival first took place in the series of sales by wholesalers. The sequence in the rise of 1923 is not clear, the sales by wholesalers not showing any definite peak.

The greater susceptibility of the wholesale sales index to cyclical fluctuations is also observable in the present case. The standard deviation of the wholesale series is 6 2 as compared to 4 4 for the retail sales (6 7 and 4 5 for the first 67 months). And again this difference in the amplitude of fluctuations is true more for the first post-war cycle than for the years 1922-25 following.

Candy

The consumers' demand satisfied by candy stores goods may be supposed to be partly similar to that in the drug stores, if for the only reason that both kinds of stores are selling candies and operating soda fountains. What is the

exact nature of the demand for these latter commodities is a matter of conjecture. As to the soda-fountain goods, we can reasonably guess that the physical volume of demand for them does not vary much with a change in price or in "times," the money value of the goods being a standard fixed amount and rather small per unit The demand for these goods is influenced by the weather, and seasonable conditions being favorable, their utility becomes large as compared to their money value. The case of candies is somewhat different, these being more of a luxury and not directly dependent upon the weather. It may be supposed that the physical volume of demand for candies does vary within certain narrow limits in connection with the change from "good" to "bad" times or with the price.

The statistical data consist of an index covering sales in four candy chain systems, which operated 114 stores in January, 1924, and had total sales in 1923 of about 20 million dollars. This index runs as follows:

11 SALES IN CANDY CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	91	111	109	92	95	100	99
February	91	110	104	94	94	102	106
March	83	114	121	92	110	96	94
April	90	108	97	96	93	111	106
May	85	110	101	95	103	104	101
June	83	111	107	95	109	99	102
July	86	115	103	91	103	98	91
August	92	111	102	94	102	95	99
September	91	111	97	96	100	101	100
October	96	114	94	90	101	102	101
November	104	110	92	93	102	102	99
December	111	110	93	90	98	100	91

The chart on page 19 illustrates this table:

The chart shows here again some conspicuous cases of accidental fluctuations caused by the shifting of Easter Sunday from March to April. Thus the jump in the retail sales in March, 1921, and probably in March, 1923, is a result of the holiday falling in these years on March 27th and April 1st, respectively.

6   Sales by Candy Chain Stores and by Candy Manufacturers, Dollar Volume, 1919-1925
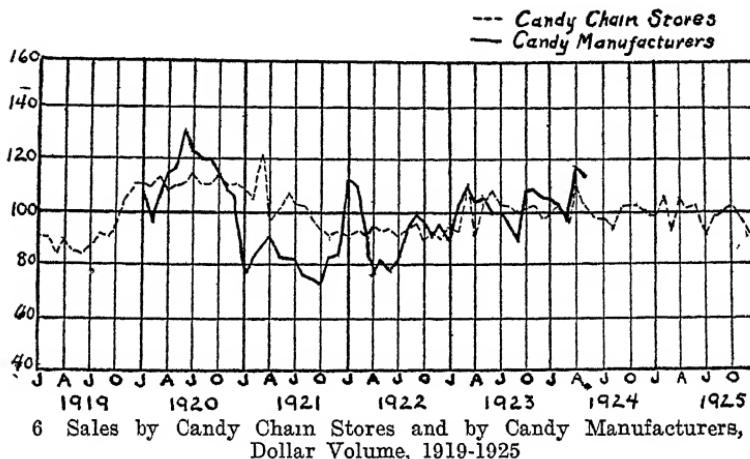
The nature of the demand satisfied by candy stores makes for close correspondence between the movements of candy and drug store sales   It is not surprising that the coefficient of correlation between the two series is very high, + 908   But in the sales of candy stores we do not observe any definite cycle fluctuations after 1921. This is already the second series of retail sales for which we notice this absence of marked cyclical changes.

The standard deviation for the series is 7 9 (8 6 for the first 67 months), indicating an amplitude of fluctuations greater than in the case of the drug chains and department stores but smaller than that in groceries, dry goods, and shoes.

We do not possess any data on sales by candy wholesalers,

but the *Survey of Current Business* publishes an index of sales by candy manufacturers based on the reports of these latter in the payment of a sales tax to the Bureau of Internal Revenue. This index runs by months for the period January, 1920-May, 1924. Manufacturing confectioners sell to both wholesalers and retailers. Estimates as to the proportions of the direct and indirect sales vary.[9] In the case of candy chain stores we can reasonably suppose that the proportion of goods bought directly from manufacturers is higher than the average in the trade. There are then grounds to compare the retail sales series with this index of sales by candy manufacturers This latter is presented in the following table:

12. SALES BY CANDY MANUFACTURERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1920	1921	1922	1923	1924
January	109	77	113	90	104
February	96	81	110	101	102
March	108	86	84	111	97
April	115	93	75	104	118
May	116	82	81	106	115
June	131	81	76	100	
July	123	81	81	100	
August	120	76	93	95	no data available
September	120	74	100	89	
October	115	73	95	107	
November	109	83	90	108	
December	104	84	96	105	

On the whole there is a good correspondence between the two series (see chart above), with one conspicuous exception, that of the rise in manufacturers' sales in January-February, 1922 The cause of this rise lies probably in the tax reduction which became effective January 1, 1922, the rate having been reduced from 5 to 3 per cent. of the sales value. Either the manufacturers withheld impending sales at the end of 1921 and deferred them to the first months of the next year or

[9] See *Federal Reserve Bulletin,* December, 1919, p. 1133

it was due to the desire of the buyers to enjoy the benefit of lower taxes, i.e , of lower prices. This might account for the swelling sales during the first two months of 1922

The index of sales by candy manufacturers moved either simultaneously with the retail sales or preceded the latter in its movements   Thus the peak of the manufacturers' sales was in June, 1920, a month earlier than in the retail series. Likewise the trough in the wholesale series occurred in October, 1921, in the retail in November.

The chart substantiates also a second general observation, that the sales by manufacturers were subject to greater fluctuations than the sales by retailers   The standard deviation for the 53 months for which comparison of the series is possible is 14 7 for the sales by manufacturers, and 8.0 for the retail sales, a very substantial difference in the variability. And again here as in nearly all other cases, the difference was much more apparent for the years 1919-21 than for the years following.

Tobacco and Cigars

-    Tobacco and cigar chain stores appear to belong to the same group as the drug and candy stores, the group that sells for the most part convenience goods which are a matter of fixed habit but which allow for fluctuations of demand within narrow limits.   The index quoted on page 22 covers the sales by three chain systems which operated 2,770 single stores in January, 1924, and had total sales for 1923 to the amount of 96 million dollars

The movements in the sales by cigar chain stores seem to be very similar to those in sales by drug chains   It is interesting that for the five years 1919-23 the highest r of the index is with drug sales .795 and candy sales 790   Like the latter series, the tobacco and cigar chain sales do not exhibit any definite cyclical fluctuations after 1921.

13. SALES BY TOBACCO AND CIGAR CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	77	105	112	98	99	98	100
February	81	106	111	99	97	100	101
March	87	107	111	100	103	99	95
April	86	109	113	100	96	96	97
May	90	113	103	98	98	99	98
June	85	115	107	99	102	94	96
July	87	117	104	98	94	90	95
August	91	111	104	99	100	101	101
September	85	115	103	104	101	98	98
October	90	118	103	90	95	97	100
November	100	110	97	95	97	99	95
December	95	109	100	99	102	100	108

The index is represented by the heavy black line in the chart below:
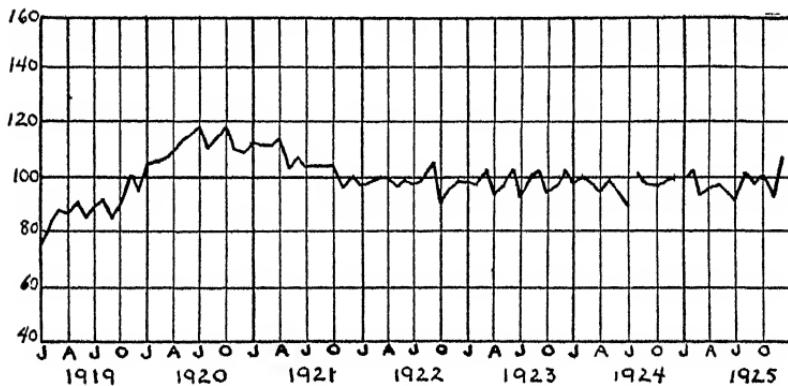
7. Sales by Tobacco Chain Stores, Dollar Volume, 1919-1925

The standard deviation of the series is 7.9 (8.6 for the period January, 1919-July, 1925), i e., exactly the same as that of the candy sales

5 and 10¢ Chains

The 5 and 10¢ stores are department stores within certain price limits They sell the same innumerable array of candy, stationery, toilet articles, household utensils, notions, small dry goods, gimcracks, toys, etc , in short everything (except groceries) which can be sold with profit within the fixed price limits The exclusion of groceries and food articles, in general, is characteristic of 5 and 10¢ stores. A variety store does not purport to supply the regular everyday needs of the consumers It sells articles which strictly speaking can be dispensed with, but which are convenient and yield comfort at a low price. You could not call those articles luxuries, but the toys, candies, perfumes, the Christmas and Easter goods are of this category in spite of their inexpensiveness. The bulk of goods in the variety stores are not bought in the spirit of shopping for something absolutely essential. There are no data on the average size of a single purchase in a variety store, but it may be guessed to be much over a price of a single article The patron comes to the store in most of the cases with the vague intention of picking out a "bargain," and even when he has a definite article in mind, he finally buys many more because of their utility and the appeal of a low price. It seems to be a peculiar kind of demand, partly fixed because of the small size of every particular price, partly variable because it is a demand for trifling semi-luxuries.

It would be reasonable to suppose that the prices in the 5 and 10¢ stores are more or less stable. Possibly in time of a general rise of prices some of the articles are transferred from one price division into another, or others may be withdrawn from sales altogether. There are, however, considerable technical difficulties in doing so, and this shifting would not make possible a pricing as elastic as in the case of department stores or groceries, where there are no cus-

tomary price units of 5 cents and no maximum price limits. We ought to expect then that the fluctuations in the dollar volume of sales by the variety stores would be smaller than in other cases, since the element of price fluctuations is absent to a large extent.

The index published by the Federal Reserve Board shows the movements in the dollar volume of sales by 5 chains, which operated 1,893 single stores in January, 1924, and had sales for 1923 amounting to 338 million dollars. The adjusted series runs as follows:

14 SALES BY 5 & 10¢ CHAIN STORES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	105	113	97	94	103	102	108
February	103	104	100	96	101	105	108
March	102	109	103	88	108	99	95
April	103	107	93	100	97	110	106
May	104	106	91	94	102	105	102
June	96	106	92	94	105	101	102
July	97	108	90	94	98	101	100
August	99	102	92	93	99	98	101
September	98	103	91	97	99	98	101
October	98	103	98	96	101	100	107
November	106	103	95	96	101	101	102
December	103	100	97	101	107	104	111

In the chart on the following page the index described is compared to the series of grocery sales, as the one to which it most closely corresponds. In the movements, the sales by 5 and 10¢ stores show the closest correspondence to the sales by grocery chain stores (r for 1919-1923 $+ .703$). But the former does not show cyclical fluctuations of the same marked type as the latter. The standard deviation for the series is 5.1 (5.2 for the first 67 months), the next smallest to that of the drug sales index, and considerably smaller than those of the other retail sales indices.

8   Sales by 5 and 10¢ Chain Stores, Dollar Volume, 1919-1925
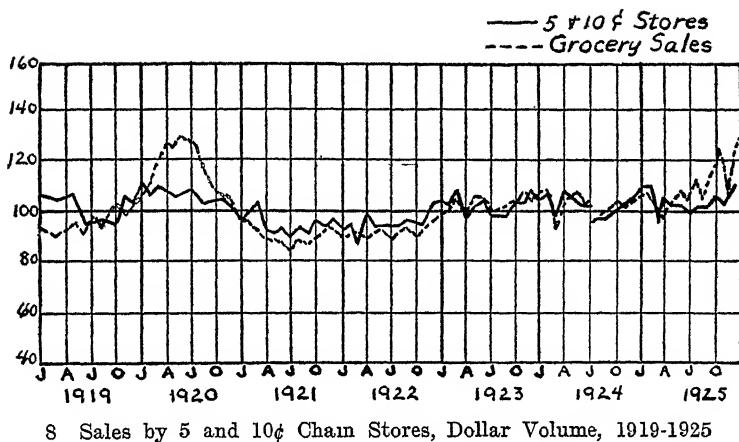
Musical Instruments

The music chain stores present a new kind of consumers' demand   There are no data on the importance of the different musical instruments in the total sales of music stores, but it would be a reasonable guess to say that the talking machines during 1919-21 and of late the radio sets formed the bulk of the sales.   Demand for these goods is in most cases like a demand for a furniture article of a quality above the average, a display luxury, an appurtenance and sign of a certain standard of living.   True, the music chains have a good percentage of demand for the sake of the article itself, but it is hardly responsible for the bulk of the sales.   Hence we can expect that in time of prosperity the music chains will enjoy a heavy volume of demand, which in depression will fall off appreciably.

The index published by the Federal Reserve Board shows movements in sales by four music chain store systems, which operated 59 single stores in January, 1924, with sales for

1923 amounting to 12 million dollars. The corrected series run as follows:

15. SALES BY MUSIC CHAINS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January . . .	80	114	93	84	112	97	97
February .	94	113	92	86	103	106	104
March . .	99	123	87	85	103	104	100
April	103	107	87	90	112	99	108
May	101	112	78	95	115	94	99
June . . .	99	120	75	101	117	89	107
July .	103	114	73	108	106	92	119
August . .	100	116	80	110	110	90	121
September .	105	106	80	112	98	97	115
October . . .	113	106	82	97	108	89	99
November . ..	106	108	86	97	114	78	93
December	104	95	90	105	108	85	88
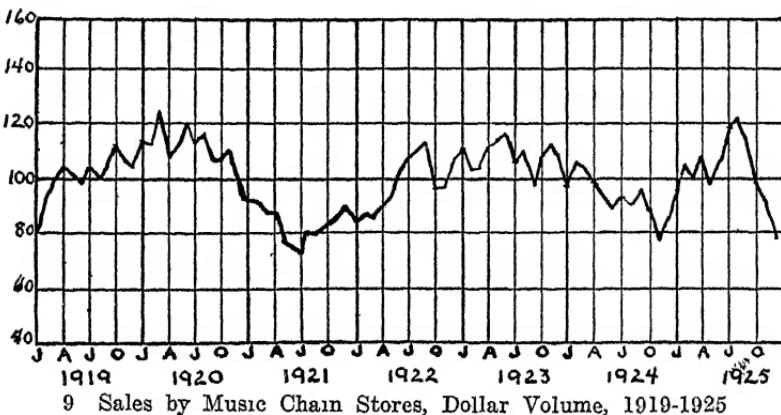
9 Sales by Music Chain Stores, Dollar Volume, 1919-1925

Most conspicuous in the movements of these music chain stores sales is the clear cut, well-defined character of the cyclical fluctuations. Both the first and the second post-war cycles can be clearly traced

The movement of this series does not show any particularly high correlation with any series considered heretofore. The

correlation coefficients of the series are with grocery sales—
.682; department stores— 611; and the 5 and 10¢ stores—
.588   The correlation with department stores and the va-
riety chains is not surprising, both selling goods somewhat
similar in nature.   But the correlation with grocery stores is
puzzling.   It results from the fact that both indices have
similar periods of rise and fall   The similarity may have
been produced by various causes   In one case (groceries) we
might have had a steady volume of demand (in physical
units) and a highly fluctuating price level, while in another
(music chain) the price may have been much more stable
but the physical volume of demand more variable.   This,
however, is a matter of pure conjecture

The standard deviation for the series described is 11.8,
(11.7 for the first 67 months) greater than for any other re-
viewed so far.

Mail-Order Houses

The movement of sales by mail-order houses is a matter of
great interest because the bulk of these sales represent pur-
chases by farmers and inhabitants of small villages   The mail-
order houses sell pretty nearly everything except fresh food
and coal   Articles of apparel, furniture, house-furnishings,
toys, hardware, painting materials, etc., are among their in-
numerable goods.

The index published by the Federal Reserve Board covers
sales by four mail-order houses, namely—Sears, Roebuck
& Co., Montgomery, Ward & Co., National Cloak and Suit Co ,
and Larkin & Co., the four having had total sales for 1923 to
the amount of 433 million dollars.   The series runs as shown
on page 28.

Here again, as in the case of the music chains only in
a still stronger form, the sales showed very marked cyclical
fluctuations.

16. SALES BY MAIL-ORDER HOUSES

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	93	130	76	72	101	112	103
February	85	144	77	71	102	113	108
March	77	122	89	79	108	102	96
April	97	115	84	85	111	124	106
May	101	113	76	89	122	112	98
June	95	112	81	90	112	117	111
July	110	118	73	87	111	104	107
August	115	114	81	83	108	93	108
September	114	102	82	86	108	106	110
October	130	88	75	94	116	103	119
November	127	108	72	97	109	99	105
December	129	87	72	98	109	115	126
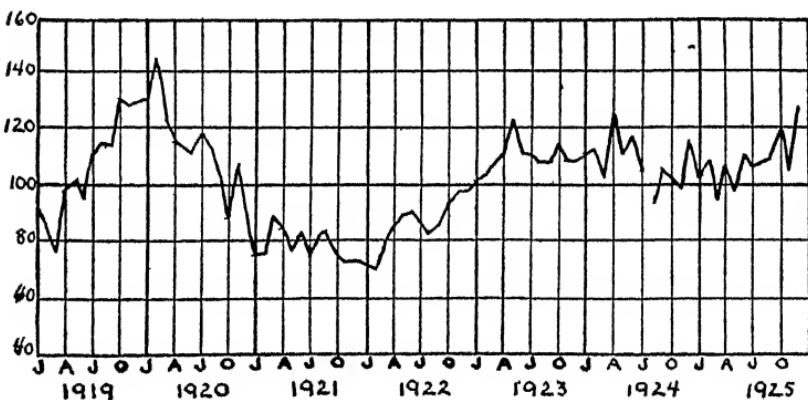
10   Sales by Mail-Order Stores, Dollar Volume, 1919-1925

It is interesting to note that the series of sales by mail-order houses has its highest coefficient of correlation with music chain sales (+.779), its next highest with the sales by groceries (+ .618). Concerning the former correlation could we say that the demand by farmers, patrons of mail-order houses, is of the same kind as the demand by the customers of the music stores? That both make the purchases only when they are well off and the times prosperous, so that a consider-

able sum can be spent on things which might be dispensed
with if the times were worse? That in bad times the sales
by both mail-order houses and music stores will be slack be-
cause in both cases the consumers will cut down on new pur-
chases of these durable, expensive semi-luxuries? I wonder.
Or, perhaps, as Dr. W. C. Mitchell commented, the close
correspondence for this period was fortuitous. Extremely
bad times may have forced the farmer during these years
to act in his ordinary purchasing as the bulk of the popu-
lation acted in buying semi-luxuries.

As to the correlation with grocery sales the following sug-
gestion can be offered. The dollar volume of sales in gro-
ceries rises largely because of the rise in the prices of food
products   A consistent rise in the prices of food products
either precedes or follows a rise in the prices of farm products,
since these latter are the raw materials for the food products.
But high prices for farm products mean prosperity for the
farmers and heavier purchases from the mail-order houses.
Thus, through this roundabout connection, the movements in
the dollar volume of sales in groceries run together with the
movements in the volume of sales by the mail-order houses.

. The standard deviation for the series in question is 16 4
(17 6 for the first 67 months) which shows it to be the retail
sales series most susceptible to large fluctuations. One should
also note that these fluctuations were more clearly marked in
the years 1919-21 than later on.

Let us now summarize the results of our survey in the fol-
lowing order of topics:

(1) The direction of the movements in retail sales; (2)
the comparison between one retail trade branch and another
in point of (a) similarity or difference in periods of rise and
decline, (b) amplitude of fluctuations. Then going over to
the corresponding wholesale series (3) the run of the move-
ments in sales by wholesalers; (4) the comparison with the

respective retail series in point of (a) similarity in the periods of rise and decline in both with an emphasis on the question of lag or precedence, (b) amplitude of fluctuations.

For the purpose of determining the run of cyclical fluctuations in the retail trade as a whole, the best method would be to compile a general index from the separate ones. But there are great difficulties in the way. First of all, there are no proper weights which can be used in weighing the separate indices. The one possible way is to weigh by the number of retail dealers in the separate branches of trade as reported by the Census of Occupations of 1920 But this would not give the proper weights for the mail-order houses, department stores, and 5 and 10¢ stores Also, the number of retail dealers cannot be said to be equal to the number . of stores, even if managers are included Moreover, even the number of unit stores in the branch of trade would not be the proper weight, since in different branches, stores have a different average volume of sales The total annual sales of a grocery store are, on the average, different from the annual sales of a candy or shoe store. In short, an index if compiled with these weights, and these seem to be alone available, would be of such dubious value that one would have to refer back continually to the separate series, and only confusion would arise.

Instead of that an attempt might be made to summarize the results in tabloid form so that the identity of each separate index is not lost, but at the same time the individual indices are placed together in a form that facilitates the comparison. Let us first tabulate the conspicuous high and low points of the series, noting their dates (see page 31).

With this table before us, we can give some uniform description of the movements in the retail trade as a whole.

As the table and charts indicate, in only three cases out of ten did the rise of sales begin immediately in January, 1919.

	Trough, 1919	Peak, 1920	Trough, 1921-22	Peak, 1923	Trough, 1924
Groceries	March, June	June	July, 21	Mar, May	August
Department Stores	March, June	July	March, 22	October	August
Dry Goods	December	July	January, 22	Mar, May	July-September
Shoes	March	Mar, July	July, 21	Uncertain	Uncertain
Drugs	Feb, June	Jan, July	Jan, July, 22	June	September
Candies	March, June	July, Mar	Oct, Dec, 22	Uncertain	Uncertain
Tobacco, Cigars	January	July, Oct	October, 22	Uncertain	Uncertain
5 & 10¢ Stores	June	January	July, 21, March, 22	Mar, June	Uncertain
Music Stores	January	March	July, 21	June	June (?)
Mail-Order Houses	March	February	February, 22	April	July

But even the showings of these three are doubtful   In the
case of dry goods the sales though beginning to rise that early,
declined again to much lower levels in December, 1919   In
the second case, that of tobacco chains, the rise stopped in
March and was not resumed until after September, 1919. And
in the third, the music chains, the sales rose up to April and
then declined to and through August, 1919. In other words,
in none of these three cases could the 1919-20 rise of sales
be said to have properly begun until late in 1919.

In five other cases table states directly that the low point
was in June or in both March and June, which means that
the rise started definitely only in the second half of the year.
In the ninth case, that of shoe sales, the March showing was
lower than that of June, but June and even July were lower·
than January, 1919, and the March item is under suspicion as
having been affected by the late Easter. In only· one case,
that of the mail-order houses sales, can it be said definitely
that the sales began to rise after March, 1919. With this one
exception, the following general statement seems to be true:
the definite rise in the dollar volume of sales in the different
branches of retail trade did not begin before the second half
of 1919   .

How long did this rise continue? In one case the peak
was in June, 1920. In six cases it was either in July or later.
In only three cases out of the ten does it seem to have been
earlier than June-July. Those are the instances of mail-order
houses, music chains, and 5 and 10¢ stores. We have just
seen that the first of these series was also an exception in the
rise in 1919. In respect to variety stores, this early decline
could be accounted for by the absence of the price element, the
rise of which could not serve to keep up the dollar volume of
sales, as it probably did in the other series. In the case of
music chains we have a demand for quasi-luxuries which dif-
fers from that represented in all other series. With these
three exceptions in mind, we can accept the following gen-

eral statement: the decline or recession in the dollar volume
of sales in the different branches of retail trade did not begin
until after the first half of 1920.

On the other hand, although the recession started only
then, the rise in sales was checked a considerable time before
the decline proper started, so that in nearly all cases we have
preceding the peak three months or more of relatively stable
high levels.   These periods were: in groceries, April-June,
1920; in department stores, January-July; in shoes, January-
July; in drugs, the same; in candies, December, 1919-July,
1920, in tobacco, July-October, 1920.

Thus the decline actually began in the second half of 1920.
When did it stop?   The table indicates that in most of the
cases the trough came in 1922 and in only 3 or 4 can it be
dated in July, 1921   In these latter, however, there is no ap-
preciable rise in sales after this early trough, but only a slow
growth   This is true in the case of groceries, with the cor-
responding period August, 1921-October, 1922, in the case
of shoes (August, 1921-February, 1923).   Only the music
chain series and possibly that of the 5 and 10¢ stores are
exceptions, in these cases there having been an appreciable rise
in sales at this early period.   But the peculiar nature of these
two series has been already commented upon   On the whole
the following general statement can be made: the volume
of retail sales did not begin to rise definitely again until after
the end of 1921.

The developments of 1923-25 are much less definite.   With
regard to three series, there seems to be no definite cyclical
fluctuations whatever   In the others they are rather vaguely
outlined.   However, as the table shows, in no case does the
peak come before March, 1923, and in all cases where it
happens to fall within the month of March there is the pos-
sibility of the influence of the early Easter.   The dating of
the trough of 1924 is also rather arbitrary, since in four out of
the 10 series the lowest point cannot be definitely indicated.

Out of the other six series, only one shows its trough in June, one in July, and the others either in August or September.

So much for any general statements which could be made on the run of fluctuations in the dollar volume of sales in the different branches of retail trade. A more detailed account could be evolved only from a study of the most important single indices.

In the comparison of the different branches of retail trade as to the similarity of their movements, we can use a more definite tool, the coefficient of correlation. In the table below are quoted the coefficients computed on the basis of data covering 59 months, through November, 1923, as extant in January, 1924.

17 CORRELATION OF CYCLICAL MOVEMENTS IN THE DOLLAR VOLUME OF SALES IN 10 BRANCHES OF RETAIL TRADE

(Jan , 1919-November, 1923, U S)

	Department Stores	Drugs	Groceries	Candies	Shoes	Tobacco	5 & 10¢ Store	Music	M. O. Houses	Dry Goods
Department Stores	*	.868	838	831	679	.660	.657	611	598	523
Drugs	868	*	733	908	674	795	539	394	442	481
Groceries	838	733	*	678	546	588	703	662	.618	414
Candies	831	908	678	*	756	.790	543	285	.381	.418
Shoes	679	674	546	756	*	624	560	291	.407	.451
Tobacco	669	795	588	790	624	*	262	.095	021	447
5 & 10¢	657	539	.703	.543	560	.262	*	588	.584	314
Music	611	394	662	285	291	095	588	*	779	.145
Mail-order Houses	598	442	618	381	407	021	584	779	*	.130
Dry Goods	523	481	.414	418	451	447	314	145	130	*

The different high points of this table were commented upon in describing the separate indices Before making any general comment, let us note that the dry goods sales show low coefficients with all other series This, in absence of any reasons to explain this fact and with plenty of reasons to

expect in some of the relations coefficients higher than many others, makes us regard with suspicion this series. At any rate it seems advisable to leave it out of the general consideration, noting that it does not tally with the general run of the table.

The general observations to be made then are as follows:

(1) Of the different series those of sales by department stores and grocery chains show consistently the highest correlation coefficients with all others. The lowest in the case of department stores is 598, in the case of groceries, .546. This means that whatever causes lay back of the fluctuations in the volume of retail sales in the different branches, they found the fullest reflection in the two series mentioned   The reasons for this fact are not obvious. Shall we say that in the case of groceries the movements of prices was sensitive to the price changes in other branches, or that the physical volume of demand changed in the same way as in all other cases? Or shall we consider any other combinations of the price and the commodity elements in the series which might account for the fact? We are in the dark until it becomes possible to differentiate the two component factors of the ·dollar-volume index. As to the department store sales, the cause of the high coefficients of correlation is partly accounted for by the fact that all the products of the other branches were being sold in department stores as well.

(2) Taking the first seven branches of retail trade, thus excluding the music chains and the mail-order houses, one can see that they all show a fairly close intercorrelation   With the exception of one coefficient (that for tobacco chains and the 5 and 10¢ stores), all the correlation coefficients are above 500 and most of them well above it. But again we are baffled in the explanation of this close correlation   It might mean that in spite of the difference in the kinds of goods represented by the indices, the run of the physical volume of demand for each of them was pretty similar in all cases,

these necessaries and convenience goods forming a kind of integral unit of consumption. That would presume that the movements in the dollar volume of sales reflected properly the movements in the commodity volume of demand. On the other hand, the physical volume of demand may be the dissimilar factor, and it is the correlation of prices that the coefficients are measuring. This problem is subject to further investigation in a later chapter

Still this correspondence in the dollar volume of sales means something taken by itself. If the volume of sales in terms of money is a vital consideration in business life, the similarity of its movements in the different branches of trade is of importance   It seems that in business life, in the activity of the business men the dollar volume of sales is assigned great importance, small volume being taken to mean depression, large volume prosperity   The basis of this attitude is in the fact that the amount of profits made is on the whole proportional to the volume of business done. True, sometimes a large volume of sales is achieved through price reduction, but this is rarely the case, lower prices generally being accompanied by lower dollar volume of sales. As to special ''sales,'' if successful they do not result in an appreciable loss to the enterprise. As a rule, rising dollar volume of sales means a rising volume of profits, a declining volume—diminishing profits. And the movement of profits means prosperity or depression   Thus the close inter-relation of the movements of sales in different branches of trade gives a realistic basis to such statements as ''prosperity in retail trade'' or analogous general phrases   In other words, it permits generalizations, if so far only on the plane of the series itself, without further differentiation of the component elements of the dollar volume measure.

(3) As the table indicates, the music chains and the mail-order houses formed a group by themselves. While they are fairly well correlated with the department stores, groceries,

and the 5 and 10¢ stores, they do not tally with all the others.

While the retail trade series are on the whole similar in their movements they differ widely in the amplitude of their fluctuations   In the table below the size of the standard deviations for each is cited, and may be taken as a measure of the variability of the series, after the secular trend and the seasonal variations have been eliminated.

18 STANDARD DEVIATIONS OF THE ADJUSTED INDICES OF DOLLAR SALES IN DIFFERENT BRANCHES OF RETAIL TRADE

(1919-1925 by Months)

Mail-order Houses	16 4	Tobacco and Cigars	7.9
Music Chains	11 8	Candy .. .	7.9
Dry Goods	11 5	Department Stores	6 3
Groceries	10 6	5 & 10¢ Stores . ..	5 1
Shoes .	9 6	Drugs . .	4 4

We see then that in one case the average fluctuation is 4.4% of the secular trend and the seasonal variation, and in another case it is 16.4%, with all other series distributed between these extreme limits   If we presume that the casual factor is of approximately equal importance in all the series (this is roughly true except perhaps with shoes), the comparative size of the standard deviations becomes the measure of the susceptibility of the series to cyclical fluctuations.   In this latter respect, in the way the dollar volume of sales reflected the cyclical movements of business life, the different branches of retail trade differed widely.   But again it must be remembered that both the coefficients of correlation and the standard deviations refer to series covering only seven years.

Heretofore, we have taken up the wholesale trade series only in comparison to the retail indices and it may be that the picture of the movements in the former is a little blurred. But at present we have the opportunity to describe clearly these movements for the wholesale trade as a whole, since the Federal Reserve Board compiles a general index of this kind.

This index includes six branches of wholesale trade (groceries, dry goods, shoes, drugs, hardware, and meats, the latter from 1921), each weighted by the total value of production for each class of goods [10] This series covering 700 firms located in 10 reserve districts runs as follows:

19   SALES BY COMBINED WHOLESALERS

(Dollar Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	84	137	83	83	109	120	110
February	82	129	89	88	113	126	114
March	79	131	90	88	110	109	106
April	91	131	87	83	107	113	106
May	95	127	81	90	106	108	104
June	97	124	78	88	104	101	101
July	108	128	78	84	101	107	103
August	101	114	83	90	106	94	103
September	102	111	83	93	108	102	107
October	108	96	85	96	114	104	116
November	110	96	76	98	111	103	110
December	136	88	78	98	105	108	113

11   Sales by Combined Wholesalers, Dollar Volume, 1919-1925
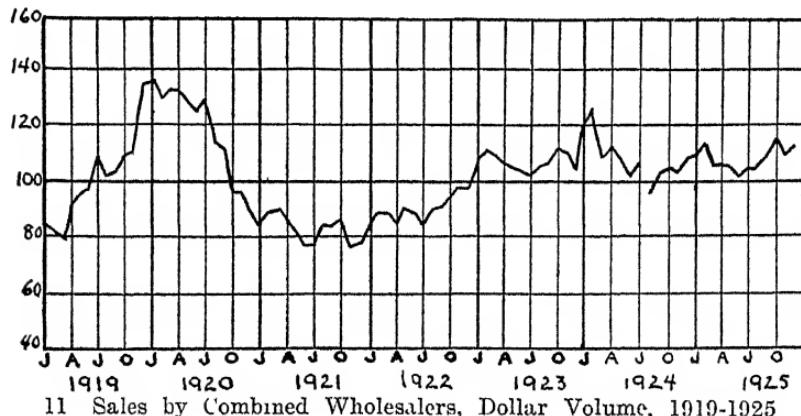
The chart reveals clear-cut cyclical fluctuations in the volume of sales. The latter declined through the first quarter

[10] For details, see the *Federal Reserve Bulletin*, April, 1923, pp 439-442

of 1919, but then rose rapidly 29 points to July, 1919. In August a break occurred but the volume of sales rose again, reaching the peak in December, 1919-January, 1920. After that the sales began to decline The falling off was slow to and through July, 1920, but then became very abrupt. Low levels were hit about January, 1921, but the recession did not stop there, going on to a trough in November of the same year. The subsequent developments were uncertain, since one does not know whether or not to take the period of December, 1921-February, 1924, as one period of rise. By taking smaller periods, one can trace the movements more clearly. The volume of sales rose slowly during December, 1921-August, 1922, but then increased more rapidly to a high point in February, 1923. During March-July, 1923, the sales declined, but in the second half of the year and through the first two months of 1924 there was a rise again, the sales reaching a peak in February, 1924, higher than any of the high points of the preceding year From March, 1924, there was a decided tendency for the volume of sales to decline. The trough of 1924 and thus of the second post-war cycle came definitely in June After that the volume of sales started to rise once again, on the whole all through 1925 There was, however, a break during the second quarter of that latter year

It is interesting to note that the correspondence in movements among the different branches of wholesale trade seems to be closer than among the same branches of retail trade. Coefficients of correlation were computed for four branches of wholesale trade for which there are counterparts in the retail series The correlation coefficients (based on 61 months) were found to be as shown on page 40.

Referring to the table above on p. 34 one can see that in every comparable case the coefficient for the wholesale series is higher than for the retail   In the case of dry goods it might be due to the character of the data, but in all other cases it is probably to be attributed to the nature of the economic

20. CORRELATION OF CYCLICAL MOVEMENTS IN THE DOLLAR
VOLUME OF SALES BY WHOLESALERS

(January, 1919-January, 1924, U. S)

	Groceries	Drugs	Dry Goods	Shoes
Groceries	*	840	797	620
Drugs	840	*	.717	643
Dry Goods	.797	717	*	776
Shoes	.620	643	776	*

process. The uniformity and the interrelation of prices and
of physical volume of sales in the different branches of whole-
sale trade is probably greater than that of prices and of
physical volume in retail lines. Since purchases from whole-
salers are made for the purpose of subsequent resale with
profit, while the purchases from retailers are made by the
ultimate consumers for the immediate satisfaction of their
wants, we can suppose that the causes making for the fluc-
tuations of the cyclical character will reflect themselves more
uniformly, and wholly by the more sensitive wholesale series
instead of the less businesslike retail indices.

We come now to the comparison of cyclical movements in
the retail and wholesale trade in so far as these branches of
business activity are represented by the dollar volume of
sales. Here the general conclusions are of the most definite
character. They refer: first, to the precedence in time of
the wholesale indices; second, to the greater amplitude of
fluctuations in these latter.

In each comparison between the movements in the volume
of sales by retailers and those in the sales by wholesalers (in
one case by manufacturers) the former tended to lag behind
the latter, the duration of the lag being variable. The same
can be seen by comparing the movement of the indices for
the two fields as a whole   While the retail sales began to
rise definitely only in the second half of 1919, the volume of
sales by wholesalers increased rapidly after the first quarter

of that year. While the retail sales began to decline only in the second half of 1920, wholesale sales started to decline in February of the same year. While the recovery in retail sales commenced on the whole only in 1922, that in the volume of wholesale sales started not later than December, 1921. Similarly the two high points of 1923 were in February and October in the wholesale trade, in March or May, and October in the retail lines.

The trough of 1924 came in the wholesale series in June, while most of the retail indices were at the lowest either in July or later. The statement about the lag of the retail sales behind the wholesale seems reasonably true for the period covered.

The other general conclusion seems no less certain. In every one of the six cases where comparison could be drawn it was found that the cyclical fluctuations in the wholesale sales were greater than in the retail trade indices. Taking again the standard deviations as the measures of the amplitude of cyclical fluctuations we can tabulate the comparison as follows:

21. STANDARD DEVIATIONS OF INDICES OF RETAIL AND WHOLESALE SALES (DOLLAR VOLUME) COMPARED

(1919-1925)

	Retail	Wholesale
Groceries . ..	10.6	14 4
Dept. Stores	6 3	15 8
Shoes	9 6	18 1
Candy	8 0	14 7
Dry Goods	11.5	16 5
Drugs	4.4	6.2

It is interesting to note that the difference in the size of the standard deviation is not the same in the various branches The character of the measure does not warrant a great reliance upon the size of the particular difference discovered.

To qualify the higher variability of the wholesale trade series it can be stated that the difference in the amplitude of fluctuations is much more marked for the period 1919-21, than for the years following   This' was observed in nearly all the cases.

So much for the general conclusions to be reached from the inspection of the series   Before we go any further in an attempt to trace the bearings and implications of some of these conclusions, we must answer one crucial question: What are the value and limitations of the data surveyed?   How far can one go in his reasoning from the general statements without ascribing to them too much validity?   An attempt to clear up this point is unavoidable if one would tread on sure   . ground

The limitations of the data seem to be as follows·

(1) The series on sales cover only (a) a small number of business enterprises, (b) in the retail trade only stores oper- ated by chain systems.

(2) The series extend only over seven years which fact makes for (a) uncertainty of the results of the statistical analysis, (b) the general character of the conclusions to be affected by the peculiar conditions of the short period de- scribed.

Let us consider first, the point 1(a), the small number of enterprises covered by the series   If one takes the number of retail dealers in every branch of trade (store managers included) reported by the Census, as roughly equal to the number of single stores in existence in 1923 (the Census fig- ures are for 1920) we can see that the indices cover the fol- lowing percentage of the stores in the field.   (See page 43.)

In only two cases the 5 and 10¢ stores and tobacco, fields where the development of chains is very strong, does the sample used exceed 10%   In all other cases it is appallingly

	Census Figures	Number of Stores Covered by Series	%
Groceries .	239,236	16,998	7.1
Boots and Shoes	22,544	340	1.5
Candy	40,091	119	0.3
Cigars and Tobacco .	19,141	2,740	14 3
Department Stores	11,752	359	3 1
Drugs and Medicine	80,157	500	0 6
Dry Goods	63,909	500	0 8
5 and 10¢	5,968	1,800	30 2
Music	7,909	59	0.7

small. Could we then accept the description presented by the data as of any bearing upon the respective branch of trade as a whole? In case of wholesale trade, we are unable to draw the comparison by branches. But according to the Census there were in 1920 73,574 wholesale dealers, exporters and importers. All six wholesale series cover 700 firms, or about 10% of the total number.

It seems to me that in spite of the small size of the sample the description given by the indices could be accepted as of practically great general validity. The case is somewhat analogous to that of price statistics. In collecting data on prices we get only a very small percentage of the total number of transactions consummated in the given market. The number of deals covered is just big enough to eliminate accidents of a singular kind, and the deals are selected so that there should be no qualitative bias The data thus found are considered as representative, the hypothesis of the uniformity of prices being relied upon Is it not an analogous situation here? Though the sample is small, it is in every case large enough to exclude accidental circumstances of an individual kind. At the same time the competitive process working toward uniformity of prices makes for uniformity of all the business units of a given field in the relative movement of their sales In absence of any qualitative bias, and

of individual variations which might be present in a small sample, there is no reason to suppose that the data would not reflect movements common to the field as a whole. On the count that the sample forms a very small percentage of the field we cannot indict the data, since they describe an activity where the leveling process of competition and the price system is in force.

But is our sample collected without any qualitative bias? This question brings us to the point 1(b) that the series on retail sales cover only stores operated by chain systems.

For the data in question the following points of difference between chain stores and single stores are important: (1) as a rule the stores operated by chain systems are picked carefully and enjoy the monopoly of location, an important factor in retail trade, (2) the price policy of the chain stores may be different from the single stores, a chain system being able to sell at lower prices than the latter; (3) in branches of trade where credit to consumers is customary, as, e.g., groceries, the chain stores seem to be managed mostly on the cash and carry basis How do these points affect the showing of the data? As to the advantage of location, it could hardly affect the relative changes in the volume of sales. Possibly only in a time of feverish prosperity the physical limits of the store might not permit the volume of the sales to reach the high limits it otherwise would, a factor of no great certainty. If anything then, a well-situated store will have smaller fluctuations, its possible peak being cut down, and the depression not reaching its deepest possible trough The price policy seems to be a variable factor and thus more important. One could suppose that during depression the chain stores are able to undersell the single stores by offering goods at lower prices If this is true then the data given underestimate to a certain extent the depth of depression in the dollar volume of sales. On the other hand, the single stores might be expected to have more personal patronage and

thus unlikely to lose much to their competitors.   Indeed, it is hard to say whether the price policy, except in special and much advertised sales, serves to shift custom and patronage very greatly between good and bad times.   The cash and carry policy might cause the chain stores to lose part of their custom in times of severe depression, when lack of purchasing power compels some part of the population to ask credit.

In the case of department stores the sample seems to be biased by an unduly large number of the bigger enterprises. The average sales of the reporting department stores was over 4 million dollars in 1923.   If one counts about 10,000 department stores in the country then their total sales would be approximately 40 billions of dollars.   But the value of the whole retail trade in the year of high prices, 1920, was estimated as 42 billion dollars.[11]   The inclusion for the most part of the biggest department stores constitutes the same type of bias as caused by taking the chain stores.   Possibly the price policy factor is of greater importance with the former, since the big department stores use the means of advertising and "special sales" to a greater extent in pushing their goods.   In this instance there is, however, one more factor added.   A certain prestige is attached to buying in one of the big, established department stores, a prestige of social distinction combined with the consciousness of more luxurious surroundings.   In prosperous times a certain type of consumer goes shopping out of the usual limits of his neighborhood center, and patronizes the more impressive stores, enjoying the fact that his goods are delivered in a luxurious delivery truck.   If this is true, it would make for accentuated fluctuations of sales in our data, the movements in the whole field being more even.

What is the balance of all these factors?   Do the series indicate correctly the periods of rise and fall in the

[11] See article by L Mann, *American Economic Review*, December, 1923, p. 614.

whole field? Do they exaggerate or underestimate the amplitude of the fluctuations? This could be known only if additional data were collected for a number of single stores in the same branches of trade. The need for these statistics is pressing since they would give additional value to the data already available. In merely speculating on the subject, one must balance the force of habit and personal patronage over against the price appeal, a balance which would be different in various branches representing dissimilar demands It seems on the whole that, with the exception of department stores and possibly music chains, there ought to be no essential difference between the movement of sales in chain stores and in single stores (taking the relative changes). In department stores and in music chain stores the rise is accentuated by the presence of a luxury demand, but the fall is probably underestimated by cut-price sales. It is impossible to determine the net result in the variability of the series. In the main it seems that the forces of consumers' demand are of too heavy and ponderous a character in the branches covered by the data to respond greatly to different price policies, and this gives assurance of a rather general validity to the description presented by the figures.[12]

So much for the limitations by number and kind; now for the limitations of time In the appendix on the statistical methods used, the possibility of errors due to the short time covered by the series was discussed and there is no need to take them up again The peculiar features of business con-

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[12] The data on wholesale sales seem to be also a biased sample, giving undue proportion to the bigger firms Thus, the average annual sales in 1923 of the firms reporting are groceries, 1.8 million dollars; dry goods, 2 8 million dollars; shoes, 1 8 million dollars, drugs, 1 8 million dollars, averages that seem too high to be representative of the trade as a whole. The significance this bias has on the final conclusion is impossible to say with certainty It is fairly probable that it makes for accentuated cyclical fluctuations in the volume of sales. The exaggeration, however, would not seem large enough to invalidate the comparison above of the different amplitude of fluctuations in retail and wholesale sales.

ditions during the period covered by the data were treated briefly elsewhere.[13] Those peculiarities which bear on our conclusions are few. The fluctuations as shown in 1919-21 were probably above the average, being exaggerated by the process of extreme price inflation which took place during that period. On the other hand, the movements in 1922-25 were probably too much attenuated because of the extreme cautiousness of the business community fresh from the bitter experience of 1920-21. Thus if one looks for the elusive "normal" type of movements, he would probably have to look for it somewhere between the kind which developed in the first part of the period considered and those of the second part.

We are for the time being through with this painful process of considering the limitations of the data used. For the time being only, because the question will come up again every time any new use is made of the indices. It goes without saying that this recital cannot be considered as exhausting the subject, although the attempt was to make the cataloguing of defects as full as possible. But even at present the balance is uncertain, the limits not clear, much being left to the personal discretion of the person who is going to utilize them This means that all further discussion and reasoning starting from the general conclusions arrived at above are conclusive only conditionally, the condition being that further statistical studies will prove the typical character of the data. It is my personal opinion that in the conclusions which will be studied, namely, the different variability of the volume of sales by retailers and wholesalers, the data are reliable in their showing of the difference, even though the quantitative measure of the difference might be changed, in case fuller data were available. Similar reliability can be ascribed to the conclusion as to the time precedence of wholesale sales movements, and to the suggestions in connection with the correlation of the various branches in either field.

[13] See supra, pp. 1-4

Of the conclusions reached one seems to be worth considering more fully. The fact that the dollar volume of sales by wholesalers rises higher and falls lower than the volume of sales by retailers seems to be important. At present it can be considered only in its bearing upon the movement of stocks and of means of payment.

If at any given moment the volume of sales by the retailers were equal to the volume of purchases he makes from the wholesalers, his stocks would remain stable. In the long run these two flows of purchases and sales are equal in absolute volume, provided we disregard the element of long-time growth. Hence in comparing the relative changes we can say that a discrepancy in the run of the latter will be reflected as an absolute and relative change in stocks If during the rise the volume of sales by wholesalers increases more than the sales by retailers we ought to expect an increase in stocks, while during depression the stocks will correspondingly decrease.

There are no data for the volume of stocks in the various branches of retail trade, except one valuable index which gives the monthly change in the value of stocks for 318 department stores located in 10 reserve districts [14] The data follow on page 49.

In the chart on page 50 the comparison is being drawn with cumulative differences between the index of sales by the combined wholesalers (see p. 8) and sales by department stores (see p. 6). For every month the index showing of the latter was subtracted from the corresponding item of the former, thus presumably giving a showing for a change in the value of stocks. The differences thus obtained were cumulated, i.e., the item for a given month was taken as an arithmetical sum of all the preceding changes. (See

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[14] The original data used was the revised index of stocks, compiled by the Federal Reserve Board, not published fully anywhere, but available on request.

22 VALUE OF STOCKS IN DEPARTMENT STORES

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	88	113	98	97	97	101	101
February	84	117	97	98	101	104	101
March .. .	83	119	96	98	101	105	103
April . .	87	120	96	96	102	104	102
May . .	85	120	97	95	103	103	102
June .	85	121	99	95	101	101	100
July	89	123	98	94	101	99	99
August .	93	122	99	93	102	96	97
September	97	120	99	93	102	97	97
October	99	118	98	92	102	100	99
November	101	111	98	94	104	100	101
December	105	105	97	95	102	100	102

the results in the table.)   On the chart the dash line represents this cumulative difference, the line of "normal" representing zero, and the scale being magnified five times for the purpose of better comparison.

23. CUMULATIVE DIFFERENCES BETWEEN RETAILERS' PURCHASES AND RETAILERS' SALES

(Department Stores)

	1919	1920	1921	1922	1923	1924	1925
January .	− 11	+ 80	+ 47	− 37	− 36	+ 23	+ 40
February	− 31	+ 104	+ 30	− 38	− 21	+ 40	+ 44
March . ..	− 55	+ 122	+ 24	− 37	− 11	+ 48	+ 51
April . .	− 66	+ 139	+ 20	− 47	− 6	+ 46	+ 50
May . .	− 66	+ 142	+ 13	− 48	− 3	+ 43	+ 49
June .	− 52	+ 149	+ 3	− 52	− 2	+ 34	+ 48
July .	− 37	+ 164	− 17	− 60	− 4	+ 30	+ 42
August .	− 30	+ 167	− 26	− 64	− 7	+ 24	+ 40
September	− 31	+ 159	− 22	− 65	− 6	+ 22	+ 40
October . .	− 19	+ 134	− 23	− 66	0	+ 25	+ 45
November .	− 7	+ 107	− 33	− 60	+ 7	+ 29	+ 55
December .	+ 36	+ 80	− 40	− 60	+ 3	+ 36	+ 58

The standard deviation for the index of stocks is 8.5 as compared to the one for sales of 6.3.   The comparison is, however, misleading, since a change of 1% in stocks is equiva-
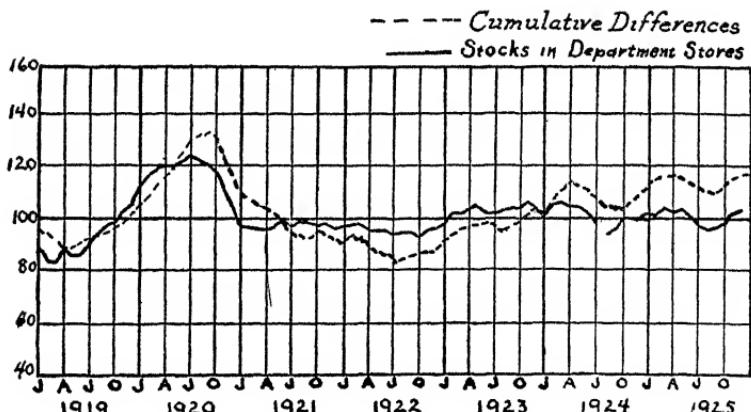
12. Index of Stocks in 318 Department Stores, Dollar Value, 1919-1925

lent to a change of 4% in sales, if we suppose that the turn-over of stocks in a department store takes place in general three times a year. Thus the standard deviation for the index of stocks of 8 5 is equivalent to a mean deviation for sales of 34 The comparison of the chart reveals that one of the indices exaggerates the fluctuations, since even a division by five gives somewhat greater fluctuations that those shown in the stock series The fault is probably with the index of whole-sale sales which covers not nearly all the branches of whole-sale trade from which department stores are buying. More-over, the big department stores buy heavily direct from the manufacturers.

But aside from that difference in amplitude, the com-parison is perfect. The movements of the index of stocks collected and analyzed independently show close correspond-ence in their changes with those in the cumulative differences, the latter being a derived series based on two others. The agreement exceeds one's expectation and illustrates perfectly an argument almost obvious in itself.

What does this cumulation of stocks and the underlying discrepancy in the movement of sales mean from the point

of view of circulation of media of payment and of the movements in the volume of credit?

If at any given moment the retailer took in from his sales a number of money units equal to those he distributes in the expenses of his store and in payment for the merchandise bought from the wholesalers, his operations would balance and no additional amount of money or credit instruments would be required Or rather though an additional absolute amount would be needed, the activity of the retailer will not produce any relative changes in the volume of media of circulation, either of money or credit instruments. This is not, however, the case. Although the payments to the wholesalers (or manufacturers) for the merchandise form about 75% of retailers' total net sales or more, and the other 25% consisting of wages of sales force, rent, etc., are much more stable than the volume of purchases from the wholesalers, still there remains a substantial discrepancy between the retailers' receipts and his expenditures In the period of rise the latter are consistently above the former, in the period of decline below them.

In other words, the discrepancy resulting in accumulation of stocks ties up a substantial volume of circulating media or gives rise to an additional volume of credit If the retailers use their own hoarded capital for the purpose of procuring these ever-increasing stocks, their accumulation means a tie-up of a volume of money which before deposited in a bank was employed elsewhere. If the retailers purchase on credit or apply for credit to the banks, they give rise to an additional volume of credit which cannot be liquidated until the volume of sales by the wholesalers begins to run below the volume of sales by retailers, and the stocks of the latter begin to be liquidated. Whether the retailer borrows from the bank or from the wholesaler, his borrowing tends to increase the volume of loans outstanding

This gives rise to the suggestion that changes in the volume

of pure commercial short-time credit must be in close correspondence, not to the movement of prices, but to the run of these cumulative differences between sales and purchases in the various branches of business activity, in other words, to the movements of stocks. It is interesting in this respect to look over the series of the volume of loans and discounts by the member banks reporting to their Federal Reserve Banks (somewhat over 800 in number). In the table below the index is quoted (without any changes) covering for the years 1919-1920 the movements in the volume of "total loans, discounts, and investments," and beginning with January, 1921, the "total loans and discounts" only. Since the investments form a comparatively small per cent. of the total, the error involved in the change of the series is not significant.

24. VOLUME OF LOANS AND DISCOUNTS

(By Reporting Member Banks)

1919 Average Month = 100

	1919	1920	1921	1922	1923	1924	1925
January	94	107	110	94	98	102	109
February	96	114	109	93	100	102	110
March	96	115	108	93	101	103	110
April	97	116	105	93	101	104	111
May	99	115	103	93	101	100	110
June	97	115	102	92	101	104	111
July	98	115	100	92	100	103	111
August	102	115	98	92	100	104	112
September	104	116	99	94	102	106	115
October	106	115	98	96	102	107	117
November	105	113	97	96	102	108	117
December	106	111	96	97	102	110	119

It is interesting to note the lag of this series as compared with the movement of wholesale prices The latter started to decline at the latest in June, 1920, and began to recover at the latest in May, 1922. The volume of loans and discounts moves, however, more simultaneously with the movement of the dash line of cumulative differences (see p. 50). This cor-

respondence is only another expression of the old truth that the "frozen" assets of the ban⅃s begin to be converted only when the debtors are able to liquidate the stocks. The movements of bank credits can be expected then to move with
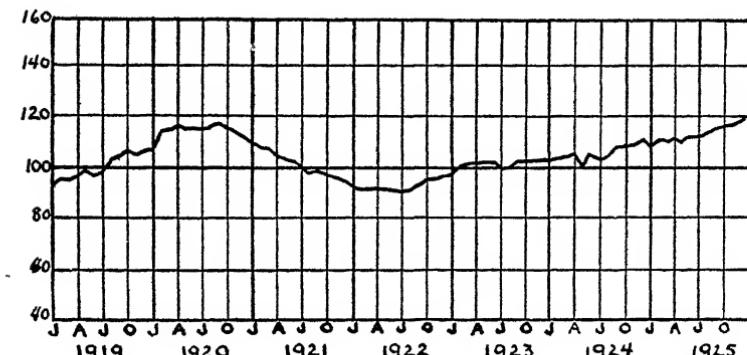
13. Volume of Loans and Discounts (Member Banks), Monthly Index, 1919-1925

the movements of the sum total of the discrepancies between disbursements and receipts in all those branches of business activity which resort to banks in order to bridge over the gap.

There are grounds to suppose that not only do the wholesalers' sales fluctuate more than the retailers', but that also the money volume of sales by manufacturers rises above and falls below the sales by respective wholesalers, and that the same relation exists between the manufacturers of consumers' goods and the producers of producers' goods. In another place we shall have the opportunity to show that the commodity volume of sales by wholesalers fluctuates less than the volume of manufacturing output. If the prices move in fair correlation with the volume of output, it is reasonable to suppose that the money sales by manufacturers are subject to greater fluctuations than the dollar volume of sales by wholesalers. The same relation exists between the two big branches

of production.   The farther we go from the ultimate con-
sumers, the more fluctuating we find the volume of business
activity as expressed in the money value of sales.   The circle
is completed when we identify the ultimate consumer, the
patron of retail stores, as himself a seller and study the move-
ments in the volume of *his* sales as compared with the changes
in the volume of his purchases   With this circle completed,
the movements in the volume of circulating media and of
bank credit have to be conceived as generated by the dif-
ferences in the flow of sales and purchases which form the
functioning of the money economy.

This indicates, if vaguely, the fact that the difference in
the movement of sales noted first as a technical characteristic
of the series compared is really an important element in the
whole problem of cyclical fluctuations in business activity.
It is in a further analysis of this difference that we can ad-
vance to its explanation and the full grasp of its implications.
And the first step in this further analysis is the description
of the movements in the commodity volume of sales and pur-
chases, a separation as far as possible of the money element
from the commodity element in the comparison itself   This
is a necessary step in the explanation of the problem.   Time
and again above we were at a loss to understand why it was
that the sales moved more evenly or less so, finding every time
the dollar volume to be a product of two factors—the price
and the commodity volume.   To the study of the flow of goods
from one branch of trade to another and to the consumers
the next chapter will be devoted

APPENDIX A

The Statistical Analysis of the Dollar Volume of Sales Indices

The main difficulty in analyzing statistically the series in
hand lay in the comparative brevity of the period covered by

the data. At the time of the final computation the indices
extended over 67 months, a period for which the computa-
tion of the secular trend and the seasonal variations might
seem presumptuous.

But both the seasonal and the long-time changes are pres-
ent in the series to a marked degree, and in varying measure
in the different branches of retail and wholesale trade. This
makes the elimination through statistical analysis both nec-
essary and feasible. Without such a preliminary adjustment
the comparison of cyclical fluctuations is almost impossible
At the same time the size of the seasonal and secular elements
makes the application of even the crudest methods of elimina-
tion worth while.

Secular Trend

For a series of six years the lower the order of the
formula for the secular trend, the surer we are of not having
eliminated alongside with the long-time changes some which
might better be classified as cyclical. Thus in composing his
new index of business conditions (of six series starting with
January, 1919), Professor Persons determines the secular
trend, using the horizontal line at the 1919-1922 average for
most of the series.[15]

This method, although having the advantage of extreme sim-
plicity, is too crude in case of a series which shows secular
trends of a comparatively large magnitude. It is good enough
for series where the long-time changes are so insignificant
that the taking of a straight horizontal line for the trend
would not imply a too great underestimation of the residual
fluctuations in the first half of the series as compared with
the same in the second half But in cases like these of the
data in hand, the element of growth is too significant to per-

[15] See *Harvard Economic Service* Advance letter of May 19, 1923.

mit ignoring the progressive character of the rise or fall from one-time limit to the other.

The next lowest order of a formula for a secular trend is a straight line of the form $y = ax + b$ The choice really lay between such a straight line trend and a parabolic trend of the form $y = ax^2 + bx + c$. The preference of the simpler form was based on the following considerations: (a) It was easier to compute; (b) the simpler one was less liable to reflect the cyclical element of the series.

The straight line trends were fitted by the method of least squares. At the time the work was completed, the series included 67 months, covering the period January, 1919-July, 1924 But the chance of printing the essay presented itself much later, and during that time new current data have ac- · cumulated. In order to take care of the latter I fitted separate trends to the seventeen months August, 1924-December, 1925, by the method of semi-averages Each of the averages was for 42 months and thus the whole length of the series was used to compute the new trend, but the trends thus computed were taken only for the last 17 months

The trends fitted by the method of least squares are good descriptions of the long-time movements, since they extend over two complete cycles. The trends fitted by the method of semi-averages cover a period of two and a half cycles (approximately) and thus may be misleading. But they are the best available for the period for which they are used.

In some cases the readings of the first trend extrapolated come very near or coincide with the readings of the second trend, and there the adjusted series is comparable all through the 84 months described. But in most cases (especially in the indices of sales by wholesalers) the readings of the two trends differ, and only a rough comparison of deviations for the two separate periods is justified.

The equations of these trends for the retail series are given

below. The starting points are January, 1919, and August, 1924, respectively. The x is in units of months.

NO. 25

	Trends for the Period January, 1919-July, 1924	Trends for the Period August, 1924-December, 1925
Department Store Sales	$y = 103\ 32 + .32x$	$y = 125\ 8 + 34x$
Mail-order Houses .	$y = 93\ 71 - 07x$	$y = 105\ 2 + 33x$
Grocery Chains	$y = 96.58 + 1\ 58x$	$y* = 221\ 9 + 2\ 03x$
5 & 10¢ Chains . . .	$y = 91.00 + 1.30x$	$y = 184\ 9 + 1\ 47x$
Dry Goods Chains	$y = 80\ 55 + 2.45x$	$y = 270\ 5 + 2.84x$
Drug Chains	$y = 99\ 63 + .79x$	$y = 154\ 5 + 83x$
Cigars and Tobacco Chains	$y = 110\ 20 + 50x$	$y = 139\ 9 + 35x$
Shoe Chains . . .	$y = 103\ 92 + .36x$	$y = 131\ 0 + .42x$
Music Chains . . .	$y = 97\ 84 + .12x$	$y = 113\ 6 + 34x$
Candy Chains . . .	$y = 99.33 + 1.39x$	$y = 188\ 1 + 1\ 28x$
Department Stores Stocks .	$y = 107\ 46 + 38x$	$y = 131\ 2 + 33x$

* A new index altogether.

It is interesting to note that the largest changes in the gradient of the trend line occurred in those series which exhibited the most marked cyclical fluctuations, such as the music chains sales, the mail-order houses sales, and the dry goods sales.

Analogous computations were made in the determination of secular trends in the indices of sales by wholesalers. The equations are as follows:

NO. 26

	Trends for the Period January, 1919-July, 1924	Trends for the Period August, 1924-December, 1925
Groceries	$y = 103\ 85 - 45x$	$y = 82.0 - 25x$
Dry Goods .	$y = 106\ 06 - 32x$	$y = 91.0 - 16x$
Drugs	$y = 100\ 61 + 13x$	$y = 112.1 + 21x$
Shoes .	$y = 96\ 97 - 69x$	$y = 59\ 6 - 45x$
Hardware	$y = 100\ 63 - 11x$	$y = 100.7 + .11x$
General Index	$y = 103\ 90 - 50x$	$y = 80\ 8 - 24x$
Candy (1920-24)	$y = 89\ 99 - 23x$	

In these series of wholesale sales the change in the trends is generally larger than the same changes in the trends of retail sales. This can be attributed to the greater size of cyclical fluctuations in the volume of sales by wholesalers.

With the secular trends thus determined, each item of the

series was divided by the corresponding showing of the secular trend and the quotient multiplied by 100.

Seasonal Variations

The index of seasonal variations for the different branches of retail trade was computed by the Division of Analysis and Research of the Federal Reserve Board The method of link relatives was used on data covering only four years.   Although this method presupposes a compound interest curve trend, the index would not be significantly different if an equal absolute size of the growth increment had been assumed (see *Harvard Review of Economic Statistics*, 1919, p. 31, note).   The adjustment for the seasonal element thus made was taken over, and the trends were fitted to already corrected data.

27 SEASONAL VARIATIONS IN RETAIL SALES [16]

	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Dept Stores	87	77	100	104	103	100	75	78	91	112	113	160
Mail-order Houses	99	91	115	100	87	84	74	77	97	128	126	122
Grocery Chain	100	95	106	101	98	96	98	97	97	105	102	105
5 & 10¢ Chain	72	75	95	95	96	92	92	96	94	108	104	181
Drug Chain	97	91	100	98	98	98	101	100	99	102	94	122
Cigar Chain	88	86	96	96	101	96	99	97	99	107	100	135
Shoe Chain	75	68	96	121	116	106	95	79	92	113	110	129
Music Chain	84	85	93	86	82	78	75	88	102	119	121	187
Candy Chain	84	85	96	102	97	92	98	101	100	103	95	117
Dry Goods	66	64	88	99	101	100	82	84	112	134	123	145

For the wholesale trade series the index of seasonal variations was computed by the method of ratio-ordinates series It gives approximately the same results as the link-relative method, but requires much less computation.[17]   This method

[16] *Federal Reserve Bulletin,* Jan , 1924, p. 17
[17] *Journal of the American Statistical Association,* June, 1924, article by Miss Falkner.

was used in both the first and second computation of the
series. The indices arrived at are presented in the following
table:

28. SEASONAL VARIATIONS IN SALES BY WHOLESALERS

	Groceries	Dry Goods	Drugs	Hard-ware	Shoes	Meats	Candy
January .	90	90	101	85	76	90	138
February	84	92	97	81	81	84	98
March . .	97	104	110	105	116	99	91
April . .	94	93	98	107	106	94	92
May	101	89	96	108	99	97	91
June	107	94	96	108	96	105	89
July .	104	104	96	97	86	103	81
August .	101	127	100	103	115	109	76
September	107	123	105	105	123	112	76
October	112	113	113	109	124	113	109
November ..	107	94	97	101	97	102	117
December	96	78	90	91	80	92	140

The seasonal element in the wholesale trade branches was
adjusted for through dividing again the series already cor-
rected for the secular trend by the index of seasonal variation
and multiplying the quotient by 100.

CHAPTER II

CYCLICAL MOVEMENTS IN THE COMMODITY VOLUME OF SALES AND OF OUTPUT

(U. S., 1919-1925)

SINCE the dollar volume of sales is a product of the price of every unit multiplied by the number of units sold, a measure of the movement of sales in terms of commodities can be arrived at through deflating the dollar series, i e., through dividing it by a properly selected index of prices. This was the procedure followed in every case where the price and sales data were available. Let us survey the results, having in mind the conclusions and suggestions made above in connection with the analysis of the money volume indices.

Groceries

In this case the series representing the dollar volume of sales in 28 chain systems of grocery stores was deflated by an index of retail prices for thirty grocery products. The quotations were selected from those published by the Bureau of Labor Statistics, and the index was computed with the average month of 1919 as a base. The series arrived at in this deflation purports to describe the movements in the commodity volume of sales   It runs as shown on page 61.

The first conspicuous thing about the commodity volume series as presented on the chart (p. 61) is the evenness of its fluctuations   The heavy black line which represents the index of retail grocery sales clings closely to the straight line of the "normal." This may be partly due to the fitting as a secular

60

29 SALES BY GROCERY CHAIN STORES

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	98	100	95	106	103	100	103
February	100	98	99	101	104	98	98
March	95	99	95	104	108	87	93
April	96	106	95	103	100	101	102
May	97	100	97	101	106	101	100
June	92	101	100	103	104	95	100
July	99	105	95	100	101	99	100
August	95	102	95	105	103	98	93
September	95	103	95	106	99	100	93
October	102	99	98	100	99	103	109
November	96	103	100	104	100	101	93
December	97	98	105	103	96	104	107

——Commodity Volume
----Dollar Volume
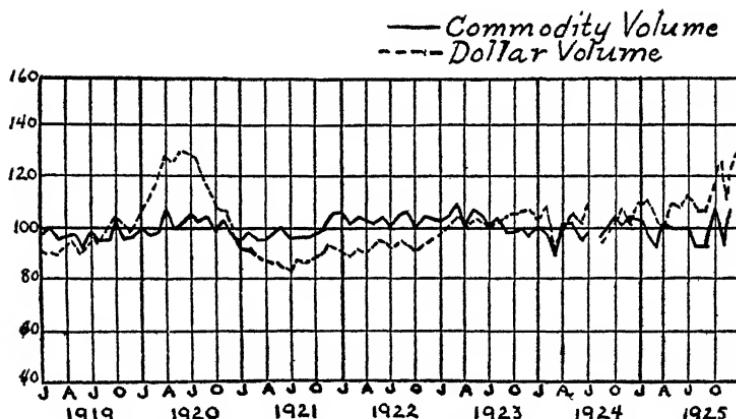
14. Commodity and Dollar Volume of Sales by Grocery Chain Stores,
1919-1925

trend of a second degree parabola But this taking of a closer trend could account only for an insignificant part of the difference in the amplitude of fluctuations which we find between the series of dollar sales and that of commodity sales in gro-

cery chain stores. The standard deviation for the former is 10.6. For the series in question it is only 4 5. It is obvious that the clear-cut cyclical fluctuations observed in the money volume of sales in this particular branch of retail trade were largely due to the price fluctuations and only to a smaller degree to variations in the commodity volume of demand

On the other hand, the run of the movements in both commodity and dollar series was pretty much the same. This correspondence suggests that the changes in the former were a repercussion of the cyclical movements in business and production. Since through coming at the same time with the money sales changes, they lagged behind the general movements in the dollar volume of business and production, and were thus seemingly a reflection of the cyclical changes in · purchasing power distributed by the economic system to the body of consumers. In another place we shall have the opportunity to compare the movements of the series in question with the movements in the volume of wages and salaries disbursed by industrial enterprises   There the correlation here suggested by the correspondence of the commodity sales to the dollar sales will be made clearer

Let us now survey the movements in the wholesale sales of grocery products, also measured in terms of commodities   The series quoted below was arrived at through deflating the money volume series by a price index composed of wholesale prices of 23 commodities (for details see the Appendix). With the correction for the long-time changes and for the seasonal variation the series runs as shown on p. 63.

Here again we note that the fluctuations in the commodity volume of sales were much smaller than those in the corresponding money volume series   The standard deviation for the latter is 14.4, for the former only 7.6. This means that in the case of wholesale sales also it is change in price that was responsible for a large part of the fluctuations in the dollar volume of sales. Evidently, the movements in the physical

30. SALES BY WHOLESALE GROCERS

(In Terms of Commodities)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January .	99	98	95	108	102	99	93
February .	92	90	103	103	105	98	91
March	94	101	103	110	96	88	89
April .	102	96	110	100	99	97	95
May . .	107	87	108	107	94	95	97
June	104	87	106	107	93	91	93
July .	109	93	111	96	95	91	94
August . . .	95	83	115	105	102	98	90
September .	101	93	107	106	99	100	95
October .	103	90	109	104	97	97	98
November .	105	97	102	104	98	89	93
December	109	100	104	98	87	89	93
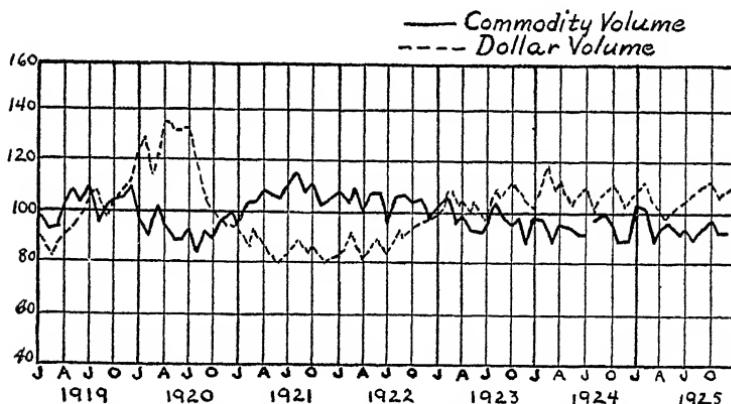
15. Commodity and Dollar Volume of Sales by Wholesale Grocers, 1919-1925

volume of demand do not completely counterbalance the movements in price

This cross current movement of prices and physical volume was more observable in the wholesale sales than in the retail sales. This is probably due to the fact that demand of the

retailers for commodities was more responsive to wholesale price changes than the demand of the ultimate consumers was to retail price changes As a result, the run of the index of sales by wholesalers in terms of commodities differ much more from the run in the dollar volume of sales by wholesalers than in the two retail series.

These differences can be quickly learned from a study of the chart (p. 63). The physical volume of wholesale sales had a much more conspicuous break in August, 1919. The decline started in January, 1920, fully four months earlier than was the case with the money volume. The decline of the commodity series terminated in August, 1920, while the dollar series kept on declining through May, 1921. The developments after that time were still more varied. The physical volume of wholesalers' sales rose rapidly from September, 1920, to August, 1921, a rise that was bigger than any during the "prosperity" period of 1919-20. From September, 1921, the commodity sales declined through to the end of the period, with minor changes which seem to have been a reflection of the ups and downs in the corresponding retail trade series. There was only a slight tendency to rise in the second half of 1925.

It is interesting to observe that the physical volume of sales was much higher on the scale of the index in 1921, the year of generally recognized depression, than in 1919, the good year. The whole comparison of the two wholesale series is a good illustration of the maxim that it is very dangerous to judge fluctuations in the flow of goods in the economic system from the movements indicated by money measurements.

A comparison can now be drawn between the retail sales series and the wholesale sales index, both measured in terms of commodities. (See chart, page 65.)

A study of the chart seems to reveal that while the individual, month-to-month changes tended to repeat themselves

in both series with a fair degree of correspondence, their movements over longer periods of time were entirely different. Thus the wholesale sales rose through March-July, 1919, while the retail sales were falling. On the contrary, in 1920 the sales by wholesalers were declining in volume through the first eight months of the year, exactly the period which marked a rising volume of retail sales After that the
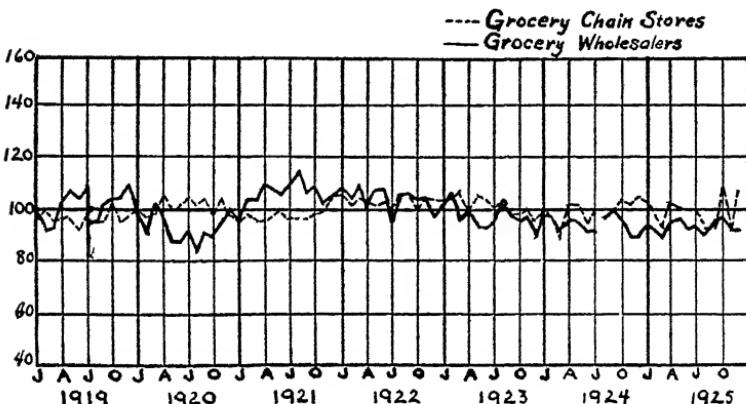
16   Commodity Sales by Grocery Chain Stores and by Wholesale Grocers, 1919-1925

directions were again reversed with the difference just as conspicuous. During the year of September, 1920-August, 1921, we observe a sharp rise in the sales by wholesalers, and a definite decline of retail sales. The same cross current can be noted during the period following to March-May, 1923. It was only once, in the decline developing during the second half of 1923 and the first half of 1924, that the retail and the wholesale series ran together. The slight rise in the wholesale sales in the second half of 1925 is not seconded by any such movement in the retail sales.

Obviously, there was no direct correlation between the movements in the physical volume of retail grocery sales and

those in wholesale sales for the period observed. The rather close correspondence noted above when comparing the dollar volume retail and wholesale indices was evidently due to the correlation of prices, and could be seen clearly because the fluctuations in prices were so much greater than the changes in the physical volume of trade

Still one suggestion could be made as to the possible connection between the movements in the two series. It is possible that the changes of retail sales do bear on the movements in wholesale sales through the cumulative influence of the former on stocks. While an increase or decline in the volume of retail sales for a given month or two will not be reflected in sales by wholesalers, a change in retail sales going on for six months or a year is bound to make for lower · or higher stocks and thus cause a change in the purchasing policy of the retailers, if up to that time there was no correspondence with the movement in the volume of their sales. Thus we might see the end of a long period of slow decline in retail sales caused by a decline in wholesale sales, or on the contrary, a year of slowly rising retail sales will in the end make for increased purchases from wholesalers Applied to the comparison of the series this might mean that the break in the wholesale series in August, 1919, would be accounted for by the decline of retail sales during the preceding half of that year. The continued increase of retail sales through the largest part of 1920 might serve to explain the cessation of the decline in the wholesale sales by September of that year.

This, however, still leaves unexplained the continuity in the movements of the wholesale series. If the cumulative effect of the retail sales movements on the volume of stocks accounts for a change in the purchasing by retailers, why does this change draw itself out through a long period of time? It is still more puzzling since during this period the retail sales are already moving in an opposite direction. Evi-

dently, other factors must be brought in to explain the movements in the physical volume of sales by wholesalers.

As measured in commodities the wholesale sales were again subject to greater fluctuations than the sales by retailers. The standard deviation for the former is 7 6, while for the latter it is only 4 5. But because of absence of correlation in the direction of the movements of the two series, we cannot take the comparison of the standard deviations as indicative of the approximate mean discrepancy between the two. In this case the difference between the receipts and expenditures was much greater than that indicated by the two standard variations, since besides the variance in the amplitude of sales, there was also the discrepancy caused by the different direction of the movements.

It might be interesting to expand the comparison, raising it one stage further from the ultimate consumer. There are no data on sales by manufacturers to wholesalers, but there are indices of manufacturing output True, these would not correspond very closely to a series of actual sales by manufacturers, although there are grounds to believe that most producers do not work ahead without having definite orders on hand.[2] But even then we might have discrepancies between sales and output, there being possible cancellations of orders, withheld shipments, etc. Still, it is interesting to compare the movements in the industrial output with the changes in the physical volume of wholesale sales, even though the former cannot be identified with sales by manufacturers.

The following series of manufacturing output were used for the purpose of this comparison wheat flour production, sugar meltings, cheese production, evaporated milk production, and oleomargarine production.[3] Each index was

[2] Cf , T. W. Mitchell, *Quarterly Journal of Economics*, August, 1924.
[3] All the series for the years 1920-1924 were taken from the *Survey of Current Business* Prior to 1920 from the primary sources indicated by the *Survey*.

weighted according to its presumed importance in the sales by wholesale grocers, and a general index was compiled of all five, the 1919 monthly average being the base (for the details of the compilation see Appendix). This index with the usual adjustments runs as follows·

31. PRODUCTION OF FIVE GROCERY GOODS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	101	117	69	102	99	105	105
February	100	108	76	107	100	126	106
March	104	100	91	104	105	107	107
April	105	97	88	102	103	100	98
May	110	97	85	107	99	97	85
June	106	104	81	105	94	105	92
July	100	106	84	113	90	115	99
August	101	95	107	116	93	100	93
September	123	90	98	103	100	115	112
October	111	71	100	98	111	102	
November	102	82	95	110	105	87	
December	104	77	99	103	100	84	
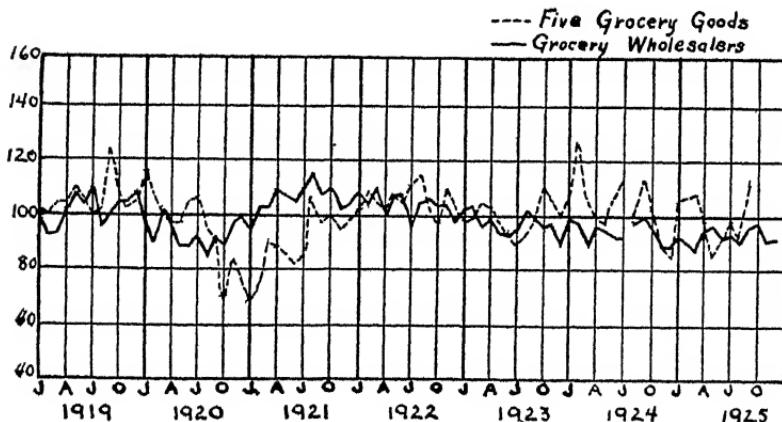
17. Commodity Sales by Wholesale Grocers and Production of Five Grocery Products, 1919-1925

In the comparison in the chart below one may observe the faithfulness with which the series of output reproduced the breaks in the series of wholesale sales. In most of the cases there was a lag of one or two months in the production index, but in an astonishing number of cases one can see a break in one series reflected accurately in the other. Since one of the indices is a derived one, and the other constructed with no connection with the former, this similarity is surprising.

But with this close correspondence in the month to month changes there can be observed significant differences in the run of the movements over longer periods of time. Thus the output of the five commodities seems to have reached the peak in September, 1919, a reflection of the peak in wholesale sales in July of that year. The next highest point in production was in January, 1920, again a reflection of the high levels in wholesale sales a month earlier. But the January output was on lower levels than the September one, hence the decline in production seems to have started in October, 1919.

The trough was reached in January, 1921, this time at least five months later than in the wholesale series. Then again, one can observe an increase in the volume of output taking place all during the period of February, 1921-August, 1922, the rise here continuing a year beyond the rise of the volume of sales by wholesalers. From September, 1922, to July, 1923, the production declined, only to rise sharply again toward February, 1924. After that the production index followed the wholesale index in its movements, but staying all the time on relatively higher levels.

One is at a loss to explain these discrepancies between the movements of production and the changes in commodity sales by wholesalers. A suggestion may, however, be helpful. It must be taken into account that two series of stocks are intervening between the manufacturing output of goods and their flow from wholesalers to retailers. These are stocks held by manufacturers and stocks held by wholesalers. It

is very probable that the accumulation of stocks on the hands of wholesalers brought about the early decline in the output in 1919, earlier than that in the wholesale sales, although even after the output began to decrease the relative volume produced continued to run above the relative volume of sales by wholesalers for a time to come. The stocks thus continued to increase well into 1920. The next discrepancy, the lag of output in the recovery of 1920-21 was probably a result of the fact that the improved demand of the retailers could be to a large extent satisfied from the existing stocks and thus the improvement was not transmitted to production until after some time had elapsed   And similarly the run of the relative output for more than a year (September, 1920-June, 1922) under the relative volume of wholesale sales might be thought of as a process of gradual liquidation of stocks. Then the rise of production in June-August, 1922, could be caused by the continued good demand of wholesalers in the face of low stocks. In other words, judging from the comparison of the two series and guessing at the movements of stocks as the result of the difference, one might project the movements as follows · the volume of stocks should have been increasing through 1919 and a part of 1920, and then falling all the time after that until late in 1922. At the end of 1922 and through 1923-1925 stocks would be increasing, since production ran on relatively higher levels than sales by wholesalers, there having been either a forward demand by wholesalers or a production for stock by manufacturers   These changes in stocks taken as a factor in purchasing would also explain the discrepancies between the wholesale sales and the output series.

It is well nigh impossible to find a definite check upon these suggestions since there are no data for stocks for exactly the commodities whose output was described above.   Still an index

could be compiled of the following four series: [4] (1) stocks of wheat flour with mills and dealers, (2) cold storage holdings of cheese, (3) stocks of cleaned rice—with the mills, (4) stocks of condensed and evaporated milk—with the producers. The indices were weighted in the same way as the production series (for details, see Appendix). Due to the absence of sugar, by far the most important commodity, this index for stocks shows a considerably reduced total weight as compared to the production index, but on the whole it is fairly reliable.

With the usual corrections made, the series runs as follows:

32. STOCKS OF FOUR GROCERY PRODUCTS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	68	116	107	95	88	101	90
February	65	139	96	103	100	103	92
March	73	157	86	97	107	94	90
April	70	144	87	98	112	92	92
May	83	134	98	97	107	102	100
June	82	116	107	86	106	125	96
July	85	104	110	90	114	126	107
August	96	111	99	83	112	110	111
September	107	118	94	73	106	110	115
October	121	106	100	76	99	110	101
November	113	114	95	80	101	101	95
December	115	111	93	84	98	94	106

The inspection of the chart on p. 72 shows that the index of stocks on the whole tallies with the suggestions made above in accounting for the discrepancies between the output index and the wholesale sales series The stocks were rising all through 1919 and up to March, 1920. They began to decline abruptly, however, in April of that latter year, and not in

[4] The original data for 1920-24 from the *Survey of Current Business*. Prior to 1920 from the primary sources indicated by the *Survey*

September as the comparison of the two series above would suggest.

It is possible that the variance in this case is due to the fact that the index quoted reflects stocks held by manufacturers for the most part and does not cover sufficiently the movements of stocks held by wholesalers. During that critical period of 1920 for which the variance is noted, the stocks held by producers might have moved differently from the
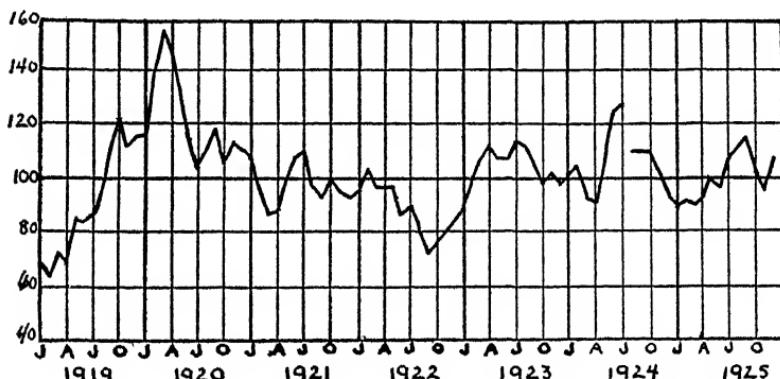
18   Index of Stocks of Four Grocery Products, Commodity Volume, 1919-1925

stocks held by wholesalers, the former possibly declining earlier than the latter. The run of the index after April, 1920, checks up also fairly well with the suggestions made above. The stocks kept declining on the whole up to September, 1922, again a difference of two to three months from the two series above, and again probably for the same reason.

After September, 1922, the stocks were rising up to July, 1923, with a decline developing thereafter. From October, 1923, we observe a cessation of the decline and then a rise with the peak in July, 1924   Through 1925 the index followed well the relative movements of wholesale sales and production. In this movement the index tallies with the comparison above. On the whole, the movement of the index

of stocks substantiates the suggestions developed from comparing manufacturing output and wholesale sales. The variances are, after all, not great, considering the different composition of the indices and the inability of the stock indices to cover equally well the stocks with manufacturers and the stocks with wholesalers.

The survey of the movements in stocks has shown one point which may be compared, and already stressed, in studying the series of retail and wholesale sales. It is the comparative amplitude of fluctuations. Just as the wholesale sales turned out to be subject to greater fluctuations than the retail sales, so, in this case, the manufacturing output turns out to be subject to greater fluctuations than the wholesale sales. On the rise the volume of output moves above the volume of sales by wholesalers, on the decline it falls below it. In the case of this comparison, this seems to have been the rule for all the observed periods of rise or decline. The standard deviation of the production index is 10.6, of the wholesale sales series, 7.6.

There are no data on sales by manufacturers to wholesalers. But if it be supposed that the volume of stocks held by producers and those held by wholesalers move in a pretty close correspondence, then the run of sales by manufacturers can be definitely surmised   They must rise higher than the sales by wholesalers, but less high than the volume of output. On the decline they must fall lower than the volume of sales by wholesalers but keep above the relative levels of production. In other words, the amplitude of fluctuations in the sales by manufacturers to wholesalers must be larger than that for the index of wholesale sales, and smaller than that for output. If the movements in manufacturers' sales were of the same amplitude as the changes in sales by wholesalers, then the stocks by wholesalers would always be on the same level, with fitful changes in the volume for the short period during which the two flows are in different directions. If the move-

ments in manufacturers' sales were of the same amplitude as the changes in manufacturing output, then the volume of stocks with manufacturers would always be on the same level, with fitful changes for the short periods of discrepancy in the direction of the movements of sales and output   The continuous rise and fall of the volume of stocks as shown in the chart above, coupled with the supposition that producers' stocks and wholesalers' stocks are moving in a pretty close correspondence, exclude the possibility of level stocks with fitful changes.   Hence, it is fairly probable that the sales by manufacturers fluctuate more than sales by wholesalers, but less than the volume of output.

For the case of groceries we thus have the picture of the progressive rise in the amplitude of cyclical fluctuations as we move further away from the ultimate consumer   The series of the physical volume of sales by retailers fluctuates the least.   The commodity sales by wholesalers are subject to larger fluctuations   The sales by manufacturers fluctuate presumably still more   Finally, the manufacturing output of groceries fluctuates the most.   To amplify the picture one might add that the sales of equipment to the manufacturer of grocery products fluctuates still more than the latter's output, this being the case of the comparatively well-established difference between the fluctuations in output of producers' and consumers' goods

Thus necessarily in every stage of business activity, on every rung of the ladder of the economic system, we have fluctuations in the volume of stocks   They are occasioned by two factors. first, by the difference in the amplitude of fluctuations both of the same direction, secondly, by a difference in direction of the change in the volume of receipts and disbursements.   Of these two factors the first is much more important, since in the cyclical movement of business life the flow of goods in the different channels tends to rise and fall at the same time, and it is the difference in the

amplitude of the rise or of the decline that accounts mainly for the sustained movements in the volume of stocks   In their fluctuations, the stocks held by retailers, wholesalers, and producers, serve as a buffer between the changes in supply and the changes in demand.   Their movements in every link of the distributive system reflect the maladjustments in the flow of receipts and disbursements of commodities, maladjustments which for some reason appear more or less regularly in every branch of business activity.

The conception of economic events as processes of continuous flow of transactions measured in money or commodities has been stressed of late (cf. Frank, T. W. Mitchell) and properly so.   It is obvious that this conception is the essence of a time series description similar to that presented above. Misapprehension may come in, however, in understanding what the series of stocks signifies   An increase of stocks does not mean that to the body of commodities already lying in the warehouse is added a new lot.   Nor does a decrease mean a bodily subtraction from a physically existing and idle body of goods.   A change in stocks means a change in the volume of goods not yet actually sold, this volume being measured at periodically successive moments of time.   The goods reported in the volume of 105 last month are probably not reported again this month as a part of a volume at 115.   It may be that the whole body of goods which lays in stocks last month was sold out entirely, and the stock that is being reported now was all produced during the current month.   The average age of the stock being reported is an interesting question, which cannot be answered here, but in no case have we to conceive the series of stocks as representing largely an inert mass of unused commodities to which something is added or from which something is subtracted.   We have here the same flow of different units of commodities as in the index of sales   It is only that at periodic intervals we put in a stick and measure the depth of the flowing stream.   It is thus

largely a changing reservoir of commodities, in which there is a constant flow in and out and the levels are a flowing resultant of the difference in the amplitudes in the movements of the stream of receipts and disbursements.

The observations made in the study of these four series of commodity sales, production, and stocks in the grocery trade can be summarized as follows:

(1) While the physical volume of retail sales moved on the whole in fair correspondence to the money volume of retail sales, the commodity volume of wholesale sales deviated significantly, declining and recovering much earlier than the dollar volume of wholesale sales.

(2) The series of commodity volume of sales, both retail and wholesale, showed fluctuations of a much smaller magnitude than the respective dollar volume series. This means that either the element of price change was so preponderantly great that even when counteracted by the movement in physical volume it still produced in the money volume series fluctuations greater than those present in the commodity volume, or that the price movement served more to magnify the commodity movement than to counteract it.

(3) As measured in terms of commodities, retail sales showed the smallest fluctuations. The sales by wholesalers showed larger ones, manufacturing output, the largest.

(4) The movement of stocks on the whole checked up with the differences noted between the series of wholesale sales and the index of manufacturing output.

Department Stores

In measuring the physical volume of sales in department stores great difficulties were encountered in constructing an index of prices which would be suitable for the purpose

of deflating the money volume series. The only data available for such use seem to be the indices of retail prices of "clothing" and "sundries," which are published by the National Industrial Conference Board as a part of their periodic studies of the cost of living. The indices run monthly beginning with January, 1920, and by four-month periods before that date. But they cover prices of a comparatively small number of articles This by itself would not be so bad, if not for the fact that the price index for the clothing group shows at least one considerable discrepancy from the more reliable but less frequently published index of the Bureau of Labor Statistics [5] It was decided finally to deflate by the National Industrial Conference Board index, this latter being the only index running monthly, but to keep results checked in constant comparison with the deflation by the Bureau of Labor Statistics' figures whenever the latter were available. (For details on the compilation of these price indices see Appendix.) The index of commodity sales in department stores runs, then, as follows:

33. SALES BY DEPARTMENT STORES

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January		95	106	99	105	99	94
February		89	112	101	105	105	99
March	102	92	110	100	107	91	91
April		84	105	104	100	100	100
May		89	105	108	104	96	93
June		90	107	105	107	94	93
July	106	95	101	102	101	97	94
August		93	105	109	108	91	91
September		92	101	109	103	102	97
October		91	106	109	108	95	105
November	91	98	99	107	101	96	93
December		99	104	109	102	100	100

[5] See Miss Elma Carr, *Journal of American Statistical Asso*, Dec., 1924.

This index is presented by a chart   (See below.)   To
facilitate the comparison with the results of the use of the
Bureau of Labor Statistics' figures as a deflator, another chart
is appended. (See page 79)   From a glance at this latter
it can be seen that there is one important difference, that
between the movements during the year of June, 1920-
September, 1921.   Since the Bureau of Labor Statistics is
the more reliable of the two, we shall take the heavy line of
the second chart as a corrective for the first one.
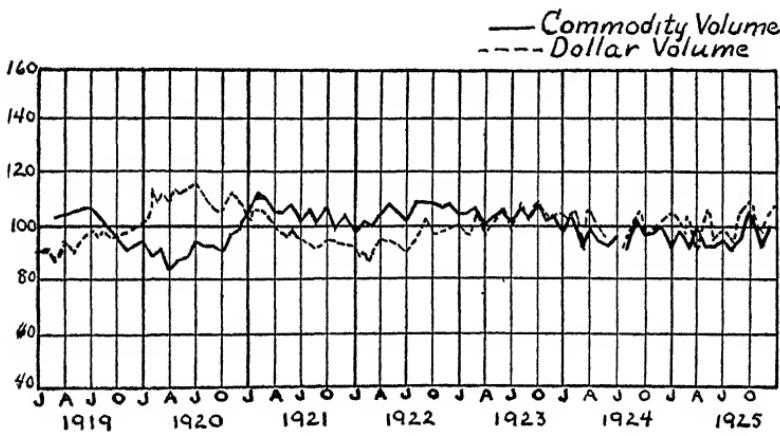
19   Commodity and Dollar Volume of Sales by Department Stores,
1919-1925

It is obvious that the physical volume of sales in depart-
ment stores exhibited movements greatly different from those
in the dollar volume of retail sales   In these latter the rise
was taking place up to and through July, 1920, with a de-
cline thereafter through 1921 and the first quarter of 1922.
Thus we observe a long period of the commodity and the
dollar volumes moving in opposite directions.   Similarly in
1922-1923, the commodity volume started to decline much
earlier than the dollar sales, the peak in the latter coming
in October, 1923.   But it should be noted that the difference

in the movements in 1922-23 is much less obvious than during 1920. It was only during the first post-war cycle that the changes in prices were so much larger than the changes in the commodity volume of trade, as to cause the money
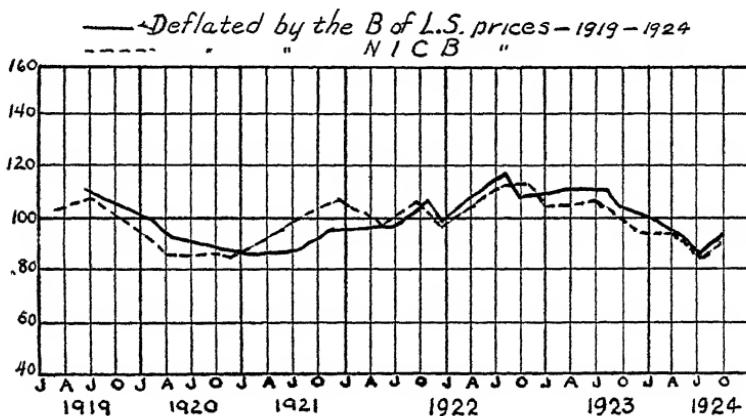
20 Commodity Sales by Department Stores, Two Indices, Quarterly and Semi-Annually, 1919-1924

volume to move more in correspondence with prices than with the physical volume of demand.

Comparing the sales by department stores with the sales of groceries (both measured in terms of commodities) one can observe no appreciable similarity between the two.

The cause of this dissimilarity could be found, possibly, in the nature of the demand in the two fields. In the case of groceries the demand is not very variable. There hardly can be any appreciable stocking of food or stretching of its consumption for a longer time, as is possible in the case of apparel and other department store articles Thus the increase or decrease in grocery sales can take place to no appreciable extent simultaneously with the good times of high wages and full employment, or bad times of low wages and unemployment. The same would be true in the case of ap-

parel, but here the demand is more variable and high prices may make for a temporary abstention, while low prices would make for an early resumption of buying. In this case we might expect saving up for the purpose of making a better purchase in times of lower prices. Thus the physical volume of purchases of clothing, shoes, etc , may move differently from the movements in prices, nominal or even real wage disbursements, and the periods of "prosperity" and depression To this another suggestion may be added. Possibly, the wage earners form a larger percentage of the patronage of the grocery stores than of the public buying in department stores. It is also reasonable to suppose that wage earners are the most improvident buyers, not because of any moral defects, but because they have a smaller stock of consumable goods than any other class of population and less time and aptitude for the process of selection and shopping. Also, their earnings are increasing on the whole through the period of prosperity (even when measured in terms of commodities) and thus their demand might be expected to move simultaneously with prices. On the other hand, salaried people and business classes which form a larger percentage in the patronage of the department stores can be expected to exercise more care in their purchasing policy. Moreover, their real incomes begin to decrease much earlier than those of wage-earners, and do not grow as much as the latter. We can thus expect here a decrease in the physical volume of demand during the last part of the period of prosperity and an early recovery during the depression.

The greater variability (not to use the term elasticity, which has a definite mathematical implication) of the physical volume of demand in department stores is shown by the fact that its series has a standard deviation of 6 3 as compared with 4.5 for the series of grocery sales.

For the purpose of comparing sales by department stores with those by wholesalers, four series of sales by these latter

were combined into one index. Sales by dry goods, shoes, drug, and hardware wholesalers, each measured in terms of commodities (money deflated), were weighted by the importance of the respective groups of commodities in the total money sales by the department stores. The index thus obtained follows:

34. SALES BY COMBINED WHOLESALERS [6]

(Commodity Volume)

	1919	1920	1921	1922	1923	1924	1925
January	85	119	77	106	116	101	92
February . . .	84	99	103	108	108	104	98
March	78	95	119	105	109	88	94
April	105	89	118	101	94	88	93
May	106	81	109	106	94	82	87
June . .	115	81	110	102	97	76	91
July .	123	100	99	99	94	82	91
August .	105	88	111	107	98	86	90
September . .	87	85	119	114	98	101	97
October . .	95	73	116	108	106	101	112
November . .	104	78	102	112	101	102	107
December . . .	126	77	107	104	90	108	103

The movements in commodity sales by wholesalers (see chart on p. 82) show on the whole a fair correspondence to the changes in retail sales   The only important discrepancy comes in December, 1919-January, 1920, and later on in the same year.

A very interesting fact and one worth noting is that in many cases the wholesale series was lagging behind the retail series, thereby reversing the relationship which we observed in the dollar volume comparison. Thus, in the peaks of 1921, 1922 and 1925 sales by wholesalers lagged one or two months behind the sales by retailers. There is a strong probability that this has been the case also in the trough of 1920. It would give one ground for believing that it is the changes in

[6] The index is a weighted arithmetic mean of individual series, each already adjusted for the secular trend and the seasonal variations.

volume of retail sales which initiate corresponding changes
in purchases by retailers from wholesalers.

But if this were the case the effect produced by the cause
was of much larger magnitude than the cause itself   A small
change in the volume of retail sales has given rise to a
much greater change in the sales by wholesalers   This is
true of all the cases observed in the chart, though the variance
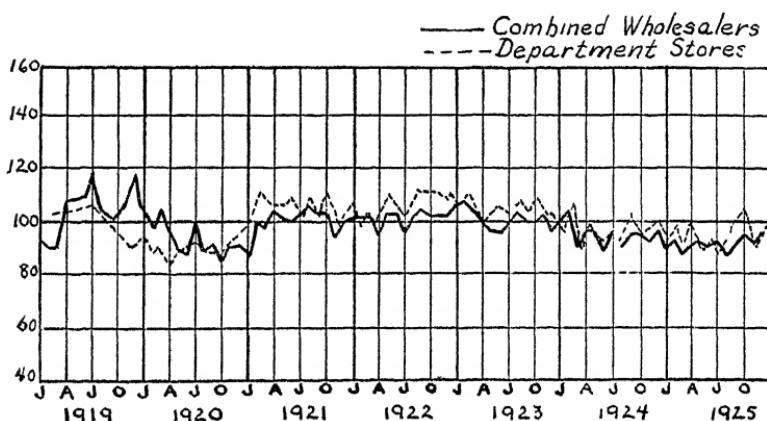
21   Commodity Sales by Department Stores and by Wholesalers in
Four Branches of Trade, 1919-1925

in the amplitude of fluctuations was much greater for the
years 1919-1921 than for the two and a half years following.
The standard deviation of the complete wholesale series is
12.0, for the 58 months comparable with the retail sales index
—11.8, while the standard deviation for the latter is only
6.3.

The comparison of commodity sales by wholesalers to the
corresponding dollar sales index would reveal a pretty fair
correlation between the movements of both, although the
position of items considered at the same instant of time in
respect to the line of "normal," is vastly different.

This similarity in the movements of the dollar and commodity volumes of sales by wholesalers would tend to show that the interworking of price and physical volume of demand was in this case different from that in retail sales   In the latter the connection between these two elements was somewhat disproportionate and laggard   With the rise of price
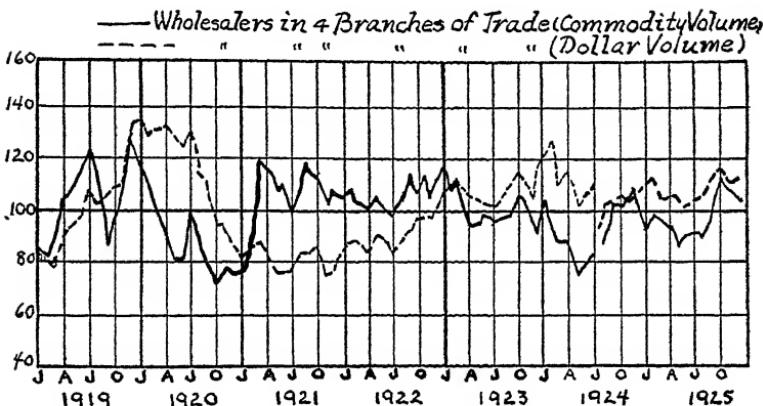
22   Commodity and Dollar Volume of Sales by Wholesalers in Four Branches of Trade, 1919-1925

the physical volume of demand by consumers fell off, but not enough to check the rise of the dollar volume, and the latter began to fall only with the decline in price.   With the fall in price, the physical volume of demand rose, but not enough to make for a rising money volume   If on the other hand, changes originated in the commodity demand, the influence on prices was not felt for some time to come   On the contrary, in wholesale sales, when a price declined low enough, the physical volume of demand revived greatly and the dollar volume of sales recovered in spite of the continued decline in price   In the period of rise, with the price reaching levels considered high, the demand fell off so much that the money volume began to decline before the prices.   On

the other hand, if changes originated in the volume of demand, prices responded more quickly than in case of the retail sales, so that again in this case the chances for the money volume and the commodity volume running together were higher in the wholesale field than in the retail

In connection with this fact it should be noted that the variability displayed by the series of commodity sales in department stores was about equal to that in the money sales series, the standard deviation for the former being 6 3, for the latter, 6.3. In other words, there were just as many cases when a high price magnified a high physical volume of demand as when it counteracted a low level in the latter, and vice versa. But comparing the two wholesale series, one finds that the standard deviation for the dollar volume index is 15 8; while that for the commodity series is 12.0. In these, prices and volume of demand ran more closely together, so that the cases when demand and price were both high or low were more numerous than the cases of high demand and low prices or high prices and low demand. The quicker response noted above made for this closer connection, and leads one to believe that the cases of discrepancy are rather exceptions, requiring a specific explanation.*

The comparison between wholesale sales and manufacturing output can in this case be drawn only between the index of

* Why was it that the money and commodity volume of sales in the case of these combined wholesalers showed correlated movements while such was not the case in the wholesale sales of groceries? The following suggestion may be helpful The production of raw materials and manufactured goods in the first case (mostly cotton and dry goods) responded to the decline of 1920 by a greatly reduced output Thus in 1921 with the consumers' and retailers' demand revived, the decline of prices was retarded and the improvement in the physical volume of sales expressed itself in the dollar volume. In the case of groceries, this reduction of output, at least of raw materials, did not occur and the prices continued to decline heavily in 1921 This lack of response in the output of food materials seems to explain the absence of correspondence between dollar and commodity sales of wholesale groceries, a correlation which was present in the case of dry goods and of shoes.

sales by the dry goods wholesalers and several series of output, none of which by itself could afford a reliable comparison. But since the specific comparisons yield similar results, we shall be able after having carried them through to arrive at general conclusions.

The series of commodity sales by dry goods wholesalers was computed through deflating the money volume series by a price index made up of the Bureau of Labor Statistics' quotations (for detail, see Appendix). With the usual adjustments, this series of sales runs as follows:

35 SALES BY DRY GOODS WHOLESALERS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	82	118	77	110	115	100	90
February	81	95	107	111	107	104	98
March	75	91	125	107	108	86	94
April	102	87	124	102	92	85	92
May	106	77	114	107	90	79	86
June	117	79	114	102	95	73	90
July	123	101	102	99	91	78	90
August	104	86	115	109	97	86	89
September	82	83	125	116	97	102	97
October	92	71	121	109	106	102	114
November	104	77	103	113	100	103	107
December	129	76	111	103	87	107	101

The general movements of this index are nearly identical with the changes exhibited by the series of wholesale sales which was used above for comparison with the department store sales. We thus need not stop to describe these movements, but can proceed at once to the comparison with the various series of manufacturing output

The first of the production indices available describes the relative changes in the output of finished cotton goods, i.e, of cotton cloth which has gone through the processes of dyeing, bleaching, and finishing. It is based on reports from manu-

facturing establishments turning out 75% of the white goods, 55% of the dyed goods, and 25% of the printed goods, manufactured outside the regular textile mills   The reports give the volume of finished yardage billed, but since the goods are billed right after they are ready, these billings can be taken as an index of output   The data are collected by the Federal Reserve Board   The original series was taken from the *Survey of Current Business,*[7] and runs from October, 1920, but lacks the two months of December, 1921-January, 1922 Adjusted roughly for the seasonal variations this production index runs as follows:

36 BILLINGS (OUTPUT) OF FINISHED COTTON GOODS

Adjusted for the Seasonal Variations

	1920	*1921*	*1922*	*1923*	*1924*	*1925*
January		39		122	107	93
February		76	106	135	117	116
March		95	105	126	93	103
April		103	104	126	95	106
May		105	106	120	88	86
June		112	112	102	73	80
July		116	116	97	79	94
August		117	118	93	78	78
September		124	108	95	87	89
October	56	112	108	110	94	93
November	44	106	112	106	83	86
December	42		117	103	100	92

The chart on page 87 gives the comparison of the series of wholesale sales with this one of finished cotton goods billings. The correspondence is close and very marked.   There were in both series the same decline in 1920, the rise in 1921, and the decline in the last quarter of that latter year and the first four months of 1922.   Another rise in both series began in the second half of 1922   1923 was ushered in with a decline, but a recovery followed in the latter part of the year.   From March, 1924, both series again showed a decline   The move-

[7] See December, 1923, p 55, and subsequent issues.
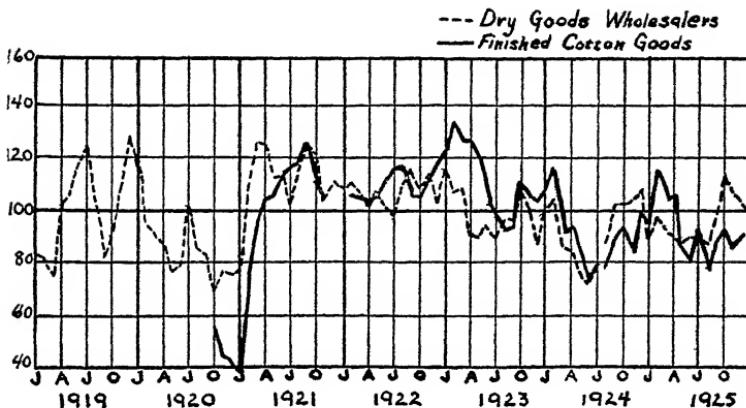
23. Commodity Sales by Dry Goods Wholesalers and Output of
Finished Cotton Goods, 1921-1925

ments in the second half of 1924 and through 1925 are similar
in both series.   On the whole, manufacturing output and the
sales by wholesalers showed the same movements.

Tracing the time sequence, it would seem that the output
series was lagging behind the wholesale sales index by a
month or two   The lag was observable in the recovery from
the 1920 depression, in the decline in the beginning of 1923,
in the start of the recovery in the second half of that same
year and in the rise of 1925   In all other cases the move-
ment was simultaneous in both series, with the exception of
one case   In this case the rise developed in 1922, whereas
the manufacturing output showed an increase as early as May,
while the wholesale sales began to rise only in August

The higher variability of the output series is no less obvious
In 1920 the relative volume of production fell very much
lower than relative sales by wholesalers, while during the
rise of 1923 and 1924 it rose perceptibly above the volume of
wholesale sales   The standard deviation for the series of
finished cotton goods billings in 19.6, while that for the index
of dry goods wholesalers' sales is 13.3   The difference is still

underestimated in this comparison of standard deviations since for the period which both series cover, viz., October, 1920-July, 1924, the standard deviation for the wholesale sales series would be much smaller than for all of the 67 months.

In a second comparison the series of fine cotton goods production is used. It is based upon the reports by 24 New England mills which form 50% of the New England fine cotton goods output (20-30% of the country's total). The index is published by the *Survey of Current Business* and runs for the period of May, 1920, to date.[8]

37. PRODUCTION OF FINE COTTON GOODS

Adjusted for the Secular Trend and the Seasonal Variations

	1920	1921	1922	1923	1924	1925
January		53	95	112	121	108
February		76	98	108	105	98
March		91	101	118	94	99
April		124	98	105	83	105
May	89	112	112	136	49	121
June	104	109	104	111	64	91
July	125	109	101	95	69	99
August	109	102	109	106	77	95
September	96	111	110	107	80	88
October	81	113	99	111	94	108
November	63	107	109	114	98	92
December	53	117	107	102	90	98

The chart on p. 89 reveals the same picture as the first comparison made above. There is the same close correspondence of the two series, even closer, since we observe in this case the correlation of production and sales in the peak of July, 1920, and production reflects also the break of July, 1921. Both series repeat the same periods of decline and rise.

The lag of the index of manufacturing output behind the index of sales by wholesalers is very obvious in this case as well. In tracing the individual peaks and troughs one can see how often the dash line reproduces the breaks in the solid line, but removed by one or two months. And this "removed"

[8] See *Survey of Current Business,* August, 1922, p. 44, and following issues.

- - - Dry Goods Wholesalers
—— Fine Cotton Goods
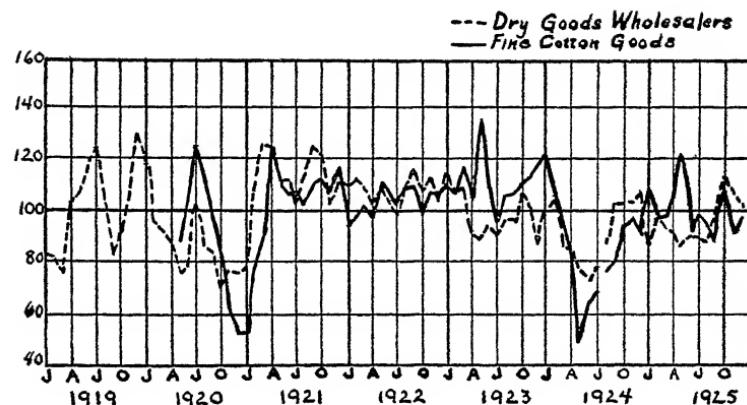
24   Commodity Sales by Dry Goods Wholesalers and Production of
Fine Cotton Goods, 1920-1925

implies a lag of the manufacturing output series also in its long periods of rise and decline.   There seem to be only two cases of a reversed sequence in time: first, as in the other comparison above, in the first half of 1922 output started to rise much earlier than wholesale sales; secondly, in the movements during 1924 the sales index lagged a month behind the production series   The general conclusion is, however, that the output tended to lag behind the volume of wholesale sales

Here again we have accentuated fluctuations in the volume of output.   The standard deviation of the production index in this case is 17.0.

Another series which could be used for comparison with wholesale sales, is that of knit underwear production.   It is based on reports by 50-60 mills whose output amounts to 30% of the country's total.   The series is published by the *Federal Reserve Bulletin* and by the *Survey of Current Business,* and runs from January, 1920.[9]

9 See *Federal Reserve Bulletin* for data up to July, 1920, the *Survey of Current Business,* August, 1921, p 8, and following issues.

For the added period of 1920 which this new comparison covers (see graph below) the correspondence between the production and the sales series is substantiated.

38   PRODUCTION OF KNIT UNDERWEAR

Adjusted for the Secular Trend and the Seasonal Variations

	1920	1921	1922	1923	1924
January	140	27	100	95	107
February	138	45	106	95	104
March	132	74	102	97	104
April	134	75	101	97	99
May	132	82	102	107	94
June	129	97	100	104	
July	141	102	98	107	
August	115	104	100	112	
September	128	110	95	102	
October	78	108	101	107	
November	35	107	98	107	
December	19	108	92	112	
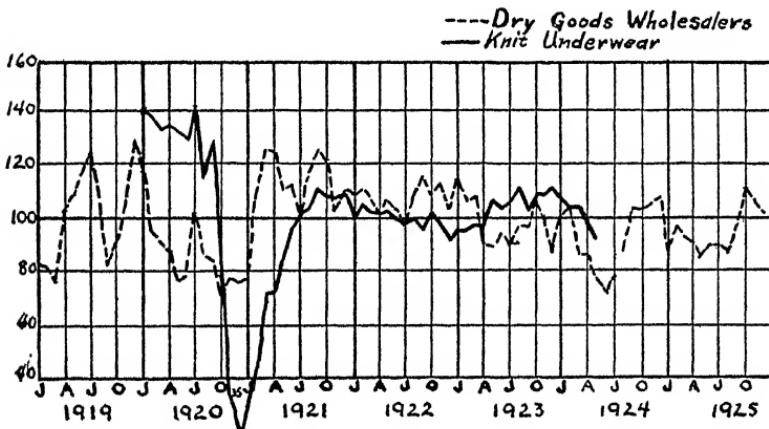
25. Commodity Sales by Dry Goods Wholesalers and Production of Knit Underwear, 1919-1924

There were substantial fluctuations in the production series. The data for 1920 give rise to the supposition that in case of the other two series of manufacturing output as well, the latter rose much more during 1920 than the wholesale sales

There was then the much lower decline towards the end of the year. Beginning with the middle of 1921, however, the fluctuations in the output series were rather small, and at the most equal to those in the sales index. The standard deviation for the production series is 24.6.

In all these comparisons we observed the same relation between the flow of goods out of the productive process and that from the wholesalers to the retailers. With a close correspondence between the two, the volume of output tended to lag after the wholesale commodity sales by a varying period of time, for the most part one to two months. And again, the volume of production displayed fluctuations considerably larger than those in wholesale sales. In the period of rise, the former rose above the latter; in the period of decline, it fell below it.

Let us test these conclusions in a comparison of sales with an index which is usually taken as the series of textile production, the consumption of cotton and wool. The two series were weighted by the weights given to cotton and woolen goods in the price index which has been used for deflating the dollar volume series (see Appendix). The index thus computed follows:

39 CONSUMPTION OF COTTON AND WOOL

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	102	122	63	102	116	103	104
February	85	117	79	106	118	101	109
March	82	115	83	105	115	86	100
April	101	118	88	88	112	94	93
May	102	105	89	97	113	76	84
June	105	103	95	102	102	65	86
July	126	101	93	100	97	74	96
August	112	90	98	110	95	75	87
September	115	86	103	104	94	90	93
October	124	75	102	107	99	105	98
November	105	58	103	112	94	91	92
December	117	54	105	109	88	104	102

On the whole, the conclusions about the close correspond-
ence between the movements in the volume of production
and those in commodity wholesale sales seem to be sub-
stantiated.   There is, however, one important exception.
During 1921 the output rose consistently, while the sales
climbed very rapidly up to March, suffered a break in April-
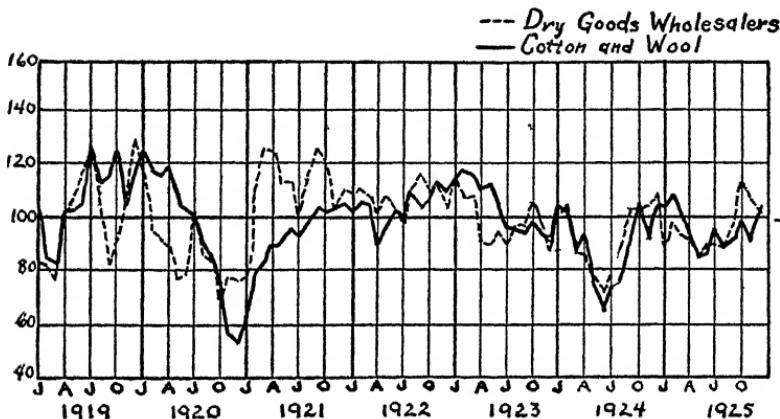
26. Commodity Sales by Dry Goods Wholesalers and Cotton and
Wool Consumption, 1919-1925

July and then rose again to September, being all the time
relatively higher than the volume of production.   This was
evidently due to the fact that the recovering demand with its
fluctuations made itself greatly felt only upon the accumu-
lated stocks, production being gradually increased by the
manufacturers because of the improved situation but without
any close connection with the changing current demand.   Or
what is more probable, it was the wholesaler who was liquidat-
ing stocks and gradually increasing the volume of his orders
to manufacturers.   But beginning with 1922 the stocks were
probably again at normal or possibly below it, and the fluctu-
ations in output and sales ran again pretty closely together.
    In this comparison the conclusion that there is lag of pro-

duction behind the volume of wholesale sales seems again substantiated. In 1919-20, although its formal peak is in July of the former year, the output still lagged in the process of its decline behind the more precipitous and faster fall of the volume of sales. In the recovery the production series lagged definitely by three months, although during three months the sales index did not rise very appreciably. In 1923 the decline in production developed again later than in the sales. The rise in production in 1925 lagged behind that of the wholesale series Only in the case of 1922, as has been already noted above, the production began to rise earlier than the sales.

The surprising fact is that the series of consumption of cotton and wool did not show a much higher variability than the series of wholesale sales. True, the former fell in 1920 much lower than the latter, but it did not rise as high in 1921, and in 1919 they ran on about the same levels. The standard deviation for the production series is 14 5, not appreciably larger than that for the sales index We saw above that in every comparison with the finished cotton goods output, the production series displayed deviations from the line of "normal" larger than those in the sales series. The same difference should have been expected in the cotton and wool consumption series, even a bigger difference, because in the latter case we have probably production of semi-finished producers' goods. What may be the cause of the comparison not justifying our expectations?

Only one suggestion can be advanced, and this concerns the difference in the size of samples covered by the two series. The consumption of wool index covers 80% of the total industry, consumption of cotton nearly the whole field. But the series of wholesale sales is based on the reports from 101 firms, where no doubt the bigger ones are disproportionally represented (witness the unduly large average annual volume of sales of nearly $3,000,000 for 1923). This character of

the wholesale sales sample might probably mean that the fluctuations shown are larger than those for the average run of business, just as in case of manufacturing we observe that the larger the enterprise, the stronger fluctuations in unemployment it shows. We are thus comparing a biased sample for the wholesale trade and a fair one for the industry. In the case of the three comparisons which preceded the last, the indices of production were also only incomplete samples and biased in the same way as the wholesale series.

This is a hypothetical explanation and it cannot do away completely with the evidence presented by the series of cotton and wool consumption against the assertion of the greater variability of the volume of output as compared to the wholesale sales In still accepting this latter conclusion as valid on the strength of the other data, we must be less sure about it on account of this unfavorable evidence.

To summarize the results obtained in the survey of the department stores-dry goods field.

(1) The commodity volume of sales in department stores fluctuated much more than that in groceries, and had the same amplitude of fluctuation as its corresponding dollar volume of sales

(2) The commodity sales in department stores exhibited movements greatly different from those in the dollar volume.

(3) The index of commodity sales by wholesalers displayed movements essentially similar to those in the money volume series, and had an appreciably lower standard deviation.

(4) The index of wholesale sales (commodity) seemed to lag behind the index of retail sales, with which it moved in definite correspondence. The index of manufacturing output seemed similarly to lag behind the series of wholesale sales

(5) There was in this case the same gradation in the amplitude of fluctuations as that observed in the case of groceries.

Retail sales fluctuated the least, wholesale sales did so to a greater extent, manufacturing output most of all.

Shoes

Shoes is another branch of trade and production where we are fortunate to have data for a thorough comparison of the flow of goods as measured in commodity volume.

The index of retail sales in this case was arrived at not through deflating the dollar volume series, but as a result of compilation of reports recording the number of pairs of shoes sold monthly. These latter were being received for the period covered by the Federal Reserve Bank of New York from four shoe chain systems, which operated 326 stores in 1924 and had the total volume of sales in 1923 as of 8 million pairs. The index was compiled in the same way as in the case of the dollar volume of sales. The data follow.

40 SALES BY SHOE CHAINS

(In Number of Pairs)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	108	120	96	91	92	101	99
February	97	106	106	102	87	103	101
March	90	103	115	88	110	93	96
April	114	90	99	114	89	123	116
May	105	106	101	92	105	105	94
June	98	102	104	96	113	101	102
July	104	120	98	96	87	93	91
August	129	96	96	101	92	102	102
September	112	87	93	102	109	112	97
October	111	93	105	92	101	97	108
November	112	105	99	93	96	102	87
December	103	97	94	103	104	105	141

Here as in the case of the money volume of sales index we observe abrupt ups and downs in the series caused by the imperfect elimination of the influence of Easter. This seems

to have been the case in March, 1921, April, 1922, March, 1923,
April, 1924.   One must be careful then in tracing the gen-
eral movements of the series, even when the latter is judged
by the three months' moving average (see chart)
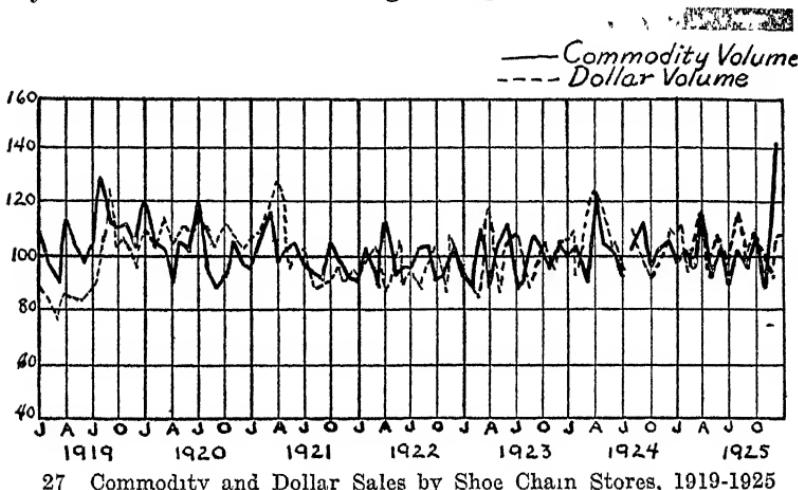
27   Commodity and Dollar Sales by Shoe Chain Stores, 1919-1925

The movements in the commodity sales by the retail shoe
chains differed essentially from the run of changes in the
dollar volume   True, there was a close correspondence all
through 1919   But the money volume began to decline only
after July, 1919, and reached the trough in July, 1921, thus
falling all through the period which registers a substantial
recovery in the commodity volume of sales   Only again in
1923-1925 the commodity and the money series seem to run
together, a circumstance due to absence of appreciable price
changes during the years.

The standard deviation for the series is 9.9 as compared
to 9.6 for the dollar volume.

The index of commodity sales by shoe wholesalers was ar-
rived at through deflating the dollar series by the wholesale
index of prices for boots and shoes [10]

[10] See *Monthly Labor Review,* July, 1924, pp. 80-89.

The series follows:

41 SALES BY SHOE WHOLESALERS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	*1920*	*1921*	*1922*	*1923*	*1924*	*1925*
January	96	132	66	95	135	109	93
February ..	98	115	78	95	115	95	87
March . .	91	109	98	93	121	94	87
April	138	92	92	95	102	107	98
May	116	90	88	93	117	92	85
June .	116	79	92	100	114	89	89
July	140	88	85	96	111	91	93
August	114	88	94	98	107	81	92
September	116	81	98	102	103	94	95
October	112	68	102	102	109	89	101
November	93	75	110	115	107	96	99
December ..	105	67	89	120	108	117	110
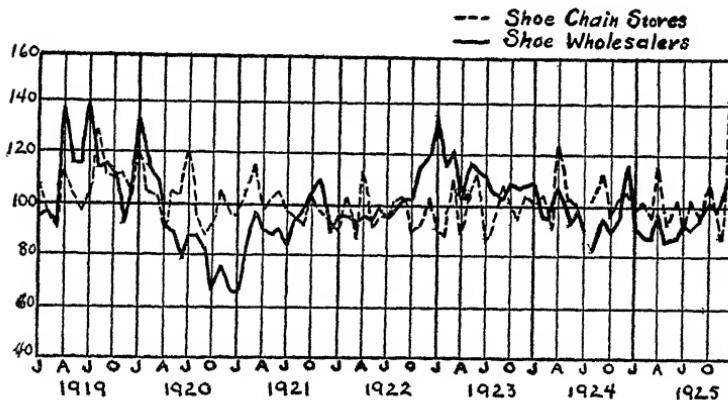
28   Commodity Sales by Shoe Chain Stores and by Shoe Wholesalers,
1919-1925

The comparison of wholesale and retail sales, both in terms of commodities, reveals a surprising correspondence of month-to-month changes in the retail and wholesale series   One can actually trace through nearly every peak in one index to a

corresponding one in the second. This close agreement speaks well for the character of the data used.

The correspondence in the longer periods of movement is much less obvious and much less certain. In the wholesale series one can observe the same period of rise in 1919 and of decline through 1920. But the decline in the wholesale sales was much greater than in the retail, and continued for four months longer. So that the recovery following was much more pronounced than in the retail sales and continued on the whole uninterrupted up to 1923 Beginning with January, 1923, there was a marked decline. Thus through at least this last year the retail and wholesale series moved in opposite directions In 1924-25 the wholesale sales showed definite fluctuations of a cyclical character, while the retail sales were on a stable level.

In view of this absence of close correspondence between the two indices it is somewhat irrelevant to discuss the question of lag But it is curious to note that in cases where comparison of time sequence is possible, there is much evidence for asserting the lag of the retail series after the wholesale. Thus in 1919 the peak of wholesale sales was in July, a month earlier than in the retail Likewise in the 1922-23 rise the wholesale sales again declined much earlier than the retail.

What were the causes of this difference between the movements of the two series, and of this precedence of the wholesale index in the cases mentioned? One may note that in both respects the shoe comparison is somewhat in between the two branches of trade considered above The difference in the movements was not as great and definite as in the comparison of wholesale and retail grocery sales, but they were not as small as in the department store comparison. Might the cause lie in some characteristics in which the case of shoes was a kind of mean between the two extremes of groceries and department store goods?

The fluctuations in demand by consumer in the latter field seem to be very appreciable. In their purchasing policy the retailers must pay attention to these changes, beside considering the factor of the probable changes in the cost of merchandise On the other hand, in groceries we observe very small fluctuations in the physical volume of demand, as the element of cost of merchandise purchased. There the speculation on prices plays the paramount rôle in the purchases of the retailers So we find correspondence between the sales and purchase series in the first instance and no such correspondence in the second one.

Shoes seem to be more of a staple than most articles sold in department stores [11] They require less capital outlay than other apparel and dry goods (not to speak of furniture and furnishings), and allow less gradations of quality. On the other hand, they are more of a specialty good and their length of service can be extended much more than that of a grocery product Thus we had more correlation between retail and wholesale sales than in the case of groceries and less than in the case of department stores

This would answer also the question of precedence. Wherever the purchasing policy of the retailers is influenced appreciably by factors other than the current movement of sales (as basis for the future forecast), there we might have any order of time sequence between the changes in retail and in wholesale sales Thus particularly in 1919 the retailers took quicker account of the coming rise of prices, thereby

[11] The suggestion that shoes are more of a staple than the bulk of goods sold in department stores and that consequently the physical volume of demand for them fluctuates less than the volume of demand in the latter seems to be disproved by the fact that the standard deviation of both series is 9.9 for shoes, 6 3 for department stores But the latter series omits the most abnormal months of 1919, while in the former the casual factors exaggerate the size of the standard deviation A three months' moving average drawn through the series of retail sales of shoes would reduce the deviation to 5 6, and the elimination of the nine months of 1919 from the comparison would make it appreciably smaller.

stocking themselves a month earlier than the ultimate consumers. In the case of 1923 there was evidently a protracted accumulation of stocks, because of a previsioned rise in prices and improved consumers' demand. Likewise, all through March, 1920-August, 1921, there must have been a gradual liquidation of stocks.

This introduces us to the second point of comparison, the amplitude of fluctuations in the wholesale and retail series Here the conclusion is much more obvious. It is evident that the volume of wholesale sales exhibited larger fluctuations than the volume of retail sales. It rose above the latter in 1919, fell much below it in 1920, and rose again above it in 1923. The standard deviation for the wholesale series is 14.6.

The comparison of the run of wholesale sales with the manufacturing output of shoes is made difficult by an absence of a series for the latter which would cover the whole period in question. The Department of Commerce started collecting data on monthly output from over 1,000 manufacturers (covering 99 6% of the country's total), but the series begins only with November, 1921 This index was extended back to August, 1920, by using the data on percentage change in output reported by the Federal Reserve Banks of Philadelphia and Chicago for a certain number of manufacturers in their districts (for details, see Appendix).

It was possible to secure from the Federal Reserve Bank of Boston index numbers running from April, 1919, showing the rate of manufacturing activity of eight New England manufacturers, whose output is about 15% of the New England total (somewhat over 7% of the total for the country). These two indices are quoted on page 101.

Of the two indices the first (pencil line on the chart, page 102) is the more reliable and thus must be given greater weight in the comparison.

On the whole, the series of wholesale sales and the indices of production had the same long periods of movement.

42 PRODUCTION OF BOOTS AND SHOES

(Dept. of Com Index Extended)

Adjusted for the Seasonal Variations

	1920	1921	1922	1923	1924	1925
January . . .		56	93	113	98	96
February .		74	91	112	99	98
March		81	94	115	93	96
April		82	90	107	94	99
May .		87	94	111	90	90
June		92	87	99	79	83
July		86	95	107	90	105
August		94	95	104	88	98
September		97	101	99	99	107
October .		92	104	105	106	107
November .	65	90	116	104	98	95
December	67	98	113	92	100	99

43 PRODUCTION OF BOOTS AND SHOES

(By Eight New England Manufacturers)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924
January .		106	68	103	120	97
February		90	76	104	130	100
March		118	76	86	127	122
April	108	123	74	80	126	92
May .	104	123	88	85	112	85
June .	92	135	93	91	101	
July	97	92	111	96	100	
August .	92	88	101	110	104	
September .	114	74	104	101	103	
October	121	52	103	108	94	
November .	113	46	112	117	94	
December .	144	58	113	111	86	

There was a marked lag in the movements in production behind those in wholesale sales This seems to be especially notable in the case of the 1919-20 rise. The bulk of the increased volume of wholesale sales can be dated as during the period of April-November, 1919, the bulk of the increased manufacturing output—at September, 1919-January, 1920, and March-July, 1920.

After 1919-20 the lag of production was not as great, but was nevertheless marked in the comparison with both production indices.   Thus the recovery of 1921 culminated much earlier in the wholesale sales index, a decline first coming in during March-June of that year, then again in December.
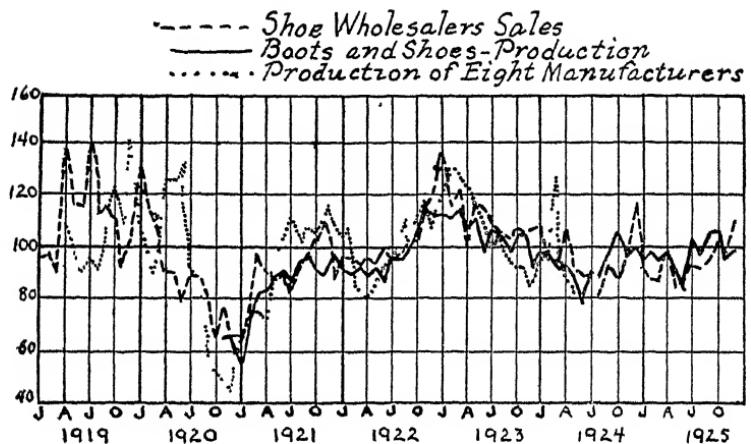
29. Commodity Sales by Shoe Wholesalers and Indices of Boot and
Shoe Production, 1919-1925

From December, 1921, a definite rise began, developing up to October, 1922   In the production series the 1921 recovery culminated only in December of that year, and then there followed a decline of 4 to 6 months' duration.   The same lag can be observed also in the culmination of the 1922 rise, the peak in production being at the earliest in November, 1922, and February, 1923, respectively.

The question of the amplitude of fluctuations is more involved.   It is obvious from a cursory glance at the chart above that the index of production by the eight New England manufacturers displayed greater fluctuations than the wholesale sales.   The standard deviation of the two series are 19 3 and 15.5, respectively   But the sample represented by this pro-

duction index is characteristic of the larger manufacturers
only, and, to quote the letter accompanying the data, "both
the seasonal and the cyclical fluctuations of the production of
these eight concerns have larger amplitudes than those of
all manufacturers in New England."

On the other hand, there seems to be no appreciable dif-
ference in the amplitude of fluctuations between the fuller
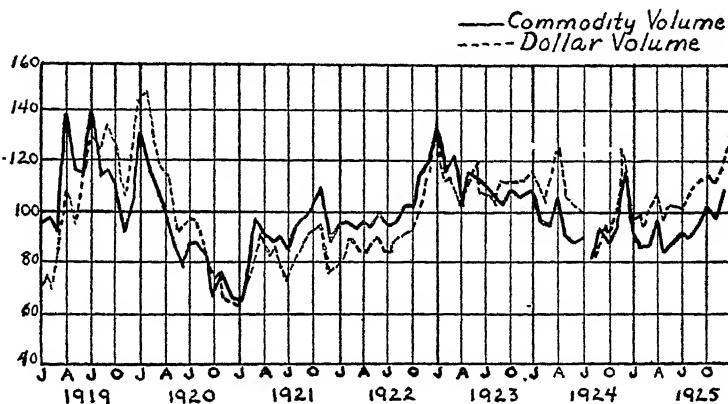
30   Commodity and Dollar Volume of Sales by Shoe Wholesalers,
1919-1925

production index and the wholesale sales series. For the 62
months for which comparison is possible, the standard devia-
tion of the output index is 13.0, of the sales series—12.7.
We must at this point recollect the suggestion made above in
connection with the comparison of cotton and wool consump-
tion to the dry goods wholesale sales As in that other case,
so also here we have an index of sales covering only a small
number of wholesalers and biased to represent the bigger
ones.   The index of wholesale sales of shoes covers only 58
wholesale firms with a large average volume of sales for 1923
of over 2 million dollars. On the other hand, the production

index is covering 99.6% of the total output of the country and thus can be hardly considered a biased sample We can suppose that this difference in the character of the series is at least partly responsible for the smaller difference in the variability as shown by the comparison of the standard deviations on page 102.

On the chart on p. 103 a comparison is drawn between the index of the commodity sales by wholesalers and the corresponding series of dollar sales by wholesalers. It was noted on p. 103 that there was no close correspondence between the commodity and the dollar series of retail sales. Here, in wholesale sales, we note on the contrary a very close correlation. Both series had the same peaks, troughs, breaks, etc. They both rose through 1919, declined through 1920, recovered in 1921, reached the peak of the second cycle in January, 1923 We thus have here again, as in department stores, a case of a closer correlation between the dollar and the commodity volume of wholesale sales, with this same correspondence present in a much smaller degree in the two volumes of retail sales.

In the same time, and possibly consequently, the variability of the commodity sales by wholesalers was definitely smaller than this of the money volume of sales The standard deviation for the former series is 18.1, for the latter, 15 5.

The conclusions reached in comparing the movements in the sales and production of shoes are very similar to those for the other two fields With the qualifications and exceptions discussed before they are as follows:

(1) The commodity volume of retail sales of shoes showed a variability somewhat lower than that of the dollar volume of retail sales, and displayed different movements through 1920-22.

(2) The commodity volume of sales by shoe wholesalers

showed no marked correspondence to the volume of retail sales, but showed high correlation with its own dollar series.

(3) The indices of wholesale sales and of manufacturing output had the same periods of rise and decline, but the production series lagged definitely behind those of sales by wholesalers.

(4) The variability of the index of retail sales was the smallest, that of wholesale sales series larger, and that of the production index the largest of the three

No more comparisons of the flow of goods in terms of commodities can be made, because of the absence of either price data or of series of wholesale sales and production. Some suggestions can, however, be stated to indicate that there seems to be additional quantitative proof of one of the main conclusions reached above—namely, of the increasing variability in the flow of goods as we rise by stages of economic activity further away from the ultimate consumers

It should be noted that in all three comparisons above the series of retail sales in terms of commodities showed nowhere a variability larger than that in the dollar volume indices. This held true in such extreme cases as the department stores on the one hand, and the grocery stores on the other There is reason to suppose that this lower or at most equal variability of the commodity volume of sales would hold true for the two series in which we are now specially interested, i.e., those of retail sales in the drug chains and in the cigars and tobacco chains.

This granted, we can compare the variability of dollar sales in retail drug stores with that in commodity sales by wholesale druggists. The comparison is not for the purpose of tracing any correspondence in movements, but merely to see which of the series shows the larger volume of fluctuations. Comparing the standard deviations, we find 5.6 for

the commodity sales by drug wholesalers, 4.4 for the money
sales by the retail druggists   If the previous assumption is
true, this comparison would indicate that the commodity sales
by wholesalers in this case also displayed cyclical fluctuations
larger than those in the physical volume of sales by the re-
tailers.

Another comparison of the same kind can be drawn in the
case of cigars and tobacco.   The series of the manufactur-
ing output of cigars, cigarettes, and tobacco (a group index
compiled and adjusted for the trend and for the seasonal ele-
ment by the Standard Daily Trade Service, see their quarterly
issue of July, 1924) taken for the five years of 1919-23 gives
a standard deviation of 11 4, while for the same 60 months
the standard deviation of the index of dollar sales by the·
tobacco chains is 9.0.

These two comparisons, hypothetical as they are, give one
more assurance as to the conclusion of rising variability.

One of our other general conclusions was that the indices
of retail sales as measured in terms of commodities showed
no such close intercorrelation as the same series taken in terms
of dollars   This may be summarized now conclusively in
the following small table of coefficients of correlation   They
were computed for the 65 to 67 months of 1919-24.

CORRELATION OF CYCLICAL MOVEMENT IN THE COMMODITY
VOLUME OF RETAIL SALES

(January, 1919-July, 1924)

	Groceries	Department Stores	Shoes
Groceries	*	.108	— 045
Department Stores ..	148	*	041
Shoes	— 095	041	*

If one turns back to the table of dollars for the dollar
series, one is surprised to see how sharply the coefficients de-
clined.   For the three series compared here the coefficients for
the dollar volume indices were all positive and all above .5.

But in the case of the commodity volume indices they are all practically negligible. This may show not so much absence of correspondence in movements as variance of the distribution of high and low points in time, a variance not apparent in the money volume of sales.

It was noted above that the different branches of wholesale trade showed greater correlation when measured in terms of commodities than the corresponding retail series. In the small table below, this observation is briefly summarized:

CORRELATION OF CYCLICAL MOVEMENTS IN THE COMMODITY
VOLUME OF SALES BY WHOLESALERS

(January, 1919-July, 1924)

	Groceries	Dry Goods	Drugs	Shoes
Shoes . . .	178	.422	.381	*
Groceries . .	*	.751	.222	.178
Dry Goods	.751	*	.303	422
Drugs	.222	303	*	.381

In all the cases comparable to the table above, the correlation between the wholesale branches of two fields of trade is greater than the correlation between the respective retail sales series.

At the same time comparing the correlation coefficients between the commodity wholesale sales and those for the dollar wholesale sales, one can see how here also the elimination of the money element did away with a large part of the correspondence and thus resulted in an appreciable decrease of the coefficients. The coefficient for the dry goods and groceries was the only one which did not fall off substantially. All the others fell from an average above .7 to an average around .3

This lower intercorrespondence among the different branches of wholesale commodity sales gives a different character to the general index of wholesale sales In the case of the money volumes series this index was largely a repetition

of the elements encountered in the case of every single index.
Here this general index will be a mechanical sum total of
different movements. This fact makes it necessary to survey
the single wholesale sales series in their similarities or dif-
ferences, a point of view omitted in the comparisons above

Let us begin with the three wholesale series the data for
which have already been quoted.
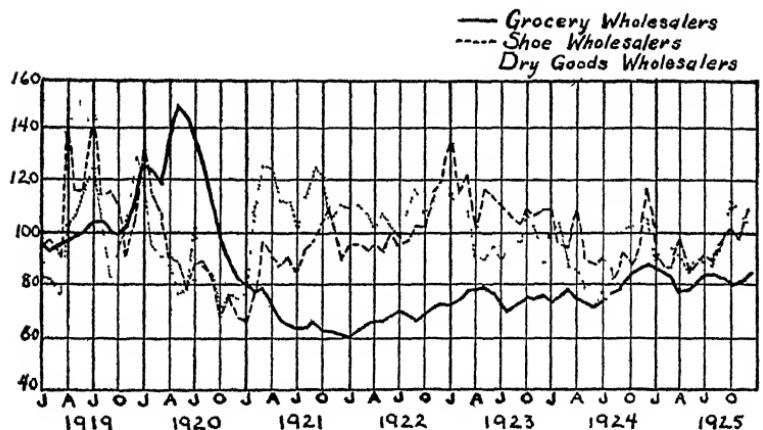
31. Commodity Sales by Grocery, Dry Goods, and Shoe Wholesalers,
1919-1925

The correspondence as indicated in the chart above is sub-
stantial, especially between dry goods and groceries, as has
already been indicated by the high coefficient of correlation.
The shoe series, however, showed no decline in the last part
of 1921 and the first part of 1922 similar to that in the two
other series. With this exception the run of the movements
was surprisingly similar. There were the same two rises in
the first period of prosperity (April, 1919-January, 1920)
with a sharp break between them. Then there was the decline
of 1920 and the recovery of 1921, again a decline (a retarda-
tion of the rise in the shoes series) in the last quarter of 1921
and the first half of 1922. Then again a rise (the weakest

manifestation in the groceries series) up to the first month of 1923, followed by a decline through the period following up to the second half of 1925. Then there is a rise observed in all the three series.

The three series of wholesale sales in terms of commodities presented below were arrived at through deflating in each case the respective dollar volume series by a corresponding index of prices (for details, see Appendix). The first series follows.

44 SALES BY WHOLESALE DRUGGISTS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	93	111	92	98	105	104	103
February	95	115	93	102	103	102	101
March	86	114	97	108	95	95	96
April	100	104	103	100	92	105	104
May	97	103	101	105	94	104	98
June	97	104	100	105	93	97	98
July	103	98	99	101	100	104	101
August	97	97	104	103	101	96	93
September	104	92	103	97	99	99	100
October	110	93	100	93	106	101	104
November	103	88	101	97	105	99	98
December	107	94	101	99	99	106	105

The peculiar features of this series of sales by wholesale druggists may be listed briefly as follows: (1) It ran evenly, the standard deviation being only 5 1, the smallest for any of the wholesale series. (2) In the developments after 1919-20 there was very little semblance of cyclical fluctuations. Both these features characterize the field of drugs as one where the fluctuations in the physical volume of demand by retailers are very small. It may be largely due to the stable character of consumers' demand combined with conditions of supply where the supply price is stabilized by the existence of a large volume of goods of standard price and quality.

Another series at our disposal describes the commodity sales by hardware wholesalers.

45. SALES BY HARDWARE WHOLESALERS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	100	125	80	81	120	108	102
February	101	115	83	86	112	111	105
March	99	113	87	92	111	96	97
April .. .	104	107	87	96	111	100	91
May	104	103	79	104	114	95	90
June . .	108	106	81	104	106	90	95
July	111	105	79	101	102	96	100
August . .	107	104	84	102	103	87	94
September . ..	105	101	86	107	101	99	103
October .	105	89	86	105	105	99	110
November	112	90	89	108	102	98	103
December .. .	119	89	83	107	101	107	112

This index shows on the whole the same two cycles displayed by the index of shoe sales Its peculiar feature was, however, the belated character of the recovery In none of the whole-sale series hitherto surveyed did the recovery begin later than January, 1921. But in the present case it began only after July, 1921. The cause may lie in the fact that the hardware wholesalers are supplying not only city stores, but to a large extent country stores patronized by farmers. Thus the acute character of the agricultural depression may have served to delay the recovery in the sales by hardware wholesalers.

The next and last series under consideration is that giving commodity sales by meat wholesalers. These data begin only with January, 1921, and could not be adjusted for the secular trend. (See page 111.)

We see that on the whole there was no great uniformity in the movements of the commodity sales in the different branches of wholesale trade. While for the dollar volume series we were observing everywhere the same two big cycles

46   SALES BY MEAT WHOLESALERS

(Commodity Volume)

Adjusted for the Seasonal Variations. 1919 = 100.

		1921	*1922*	*1923*	*1924*	*1925*
January	.	88	80	95	103	96
February		83	79	99	104	97
March	..	73	77	111	101	94
April	. .	78	76	109	101	89
May	.	77	84	103	99	98
June	. .	80	90	101	103	104
July	... .	85	86	102	106	96
August	.. .	81	84	109	$\overline{100}$	95
September	. .	78	87	107	100	93
October	. ... .	83	88	102	98	94
November		72	88	111	108	97
December	. . . .	76	92	105	91	96

——— Drug Wholesalers
----- Hardware Wholesalers
· · Meat Wholesalers
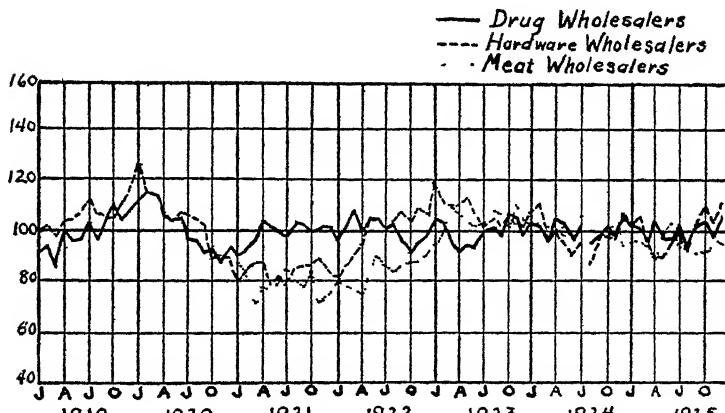
32. Commodity Sales by Drug, Hardware, and Meat Wholesalers,
1919-1925

with the peaks and troughs at approximately the same periods
in the different branches of trade, here there were at least
two types of developments after 1920, with one group of
series not showing any definite cyclical fluctuations whatever

In the combined index of wholesale sales the separate series

were given the same weight as in the compilation of the dollar volume general index. The individual series were taken without adjustment and the correction for the trend and the seasonal element was made on the combined index. The results follow:

47 SALES BY COMBINED WHOLESALERS

(Commodity Volume)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	94	107	89	101	106	100	91
February	91	99	100	101	108	104	93
March	91	104	99	101	103	90	87
April	107	97	104	95	100	97	91
May	109	90	101	102	98	97	92
June	110	89	100	102	97	89	91
July	118	100	102	97	99	97	92
August	104	90	106	101	103	90	87
September	101	93	104	104	100	95	92
October	104	86	104	102	100	95	96
November	108	93	96	102	102	93	94
December	118	94	100	102	97	97	97
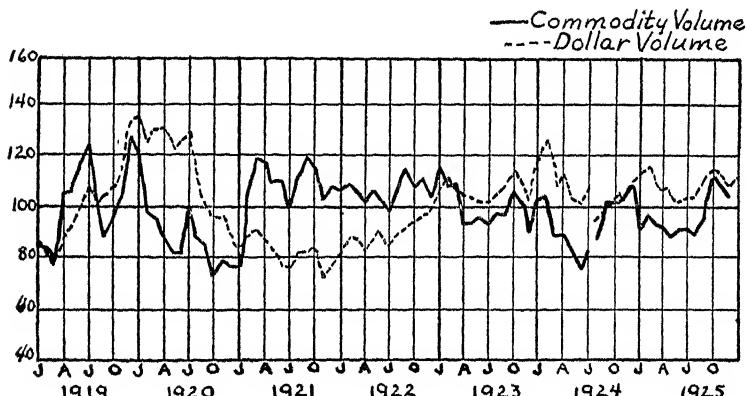
33. Commodity and Dollar Sales by Combined Wholesalers, 1919-1925

On the whole this index followed the movements in the two similar series of groceries and dry goods sales, which had

a combined weight of 59 out of 76 during 1919-20 and of 59 out of 100 during the three years following. Because of that fact the index reveals substantial differences from the dollar volume general series. In the latter the recovery started only in December, 1921, and there was no sign whatever of the recovery during the year of 1921 which was so marked in the commodity volume index. And then again, the rise in the dollar sales seems to have continued to February, 1924 (although February, 1923, is one of the high points preceding), while that in the commodity volume terminated in March, 1923. In 1925 the dollar volume was rising pretty nearly through the year, while the commodity volume started to rise only in the last quarter. On the whole, the movements in the dollar volume seem to be lagging considerably after those in the commodity volume The duration of the lag varies, the shortest being in the peak of 1919-20 (one month). This short lag was peculiarly characteristic of the first post-war business cycle, indicating a strong reaction of the physical volume of demand to the abnormal price situation, with a telling effect on the dollar volume of sales, and eventually on prices. At other times the lag was much longer, but the fluctuations in the physical volume of demand were much less appreciable.

This difference in the character of fluctuations prior to 1921 and after it, is a conspicuous feature revealed by the chart. The fluctuations in the physical volume of sales were large and clearly marked during 1919-20. They were small and indefinite through the three years following In this respect the commodity sales series differ also from the dollar volume sales. In the latter the cyclical character of the fluctuations was obvious through all five years covered.

This introduces us to another point of comparison mentioned above It has been noted that the commodity sales series fluctuated much less than the corresponding dollar volume indices Taking the standard deviations as measures

of the variability of the different series we can check up this general conclusion in the following table.

STANDARD DEVIATIONS OF THE DOLLAR AND COMMODITY
SERIES COMPARED

(Monthly 1919-1925)

		Dollar	Commodity
Retail	Groceries	10 6	4 5
	Department Stores (75 months)	6 3	6 3
	Shoes	9 6	9 9
Wholesale	Groceries .	14 4	7 6
	Dry Goods .	16 5	13.3
	Shoes . .	18 1	14 6
	Drugs	6 2	5 1
	Hardware .	13 4	10 0
	General Index . .	14 8	6.7

It can be seen that in all the different branches of retail and wholesale trade, the physical volume did fluctuate less than the dollar volume of sales. This larger variability of the dollar sales indices means either of two things. (1) That for the period covered the price fluctuations were so great, that even with the checking influence of the movements in the physical volume of demand, they made for a variability in the money volume of sales larger than that in commodity volume; (2) or that for the period covered the price movements served to magnify the changes in the commodity volume of sales rather than to counteract them: in other words, that there were more cases of high prices and good physical volume of demand than of high price and low volume of demand.

In any case, it is evident that during the period covered, the price and money element served to magnify the amplitude of initial fluctuations in business activity. It is impossible to say whether this statement has any validity beyond the period covered. It would seem doubtful in view of the ex-

tremely violent character of price fluctuations which was so especially marked during the first post-war cycle.

Before summarizing the results obtained in the survey of the commodity sales series, we must point out the additional elements of doubt brought in by the methods of deflation used. All the limitations as to time, space, etc., imposed upon the validity of the conclusions by the character of the data used, hold true here as well   But there are also new grounds for holding the conclusions as only provisional.   These new grounds of doubt are a result of the defects of the price data used for the purposes of deflation

These defects are manifold: (1) The data used included many prices which were manufacturers' quotations.   The probable influence of this use was discussed above.[12]   It is thus possible that in 1921 the price indices used were much lower than the prices actually charged by wholesalers to retailers.   As a result, the recovery of 1921 might have been accentuated more than it should have been.   But it seems, on the whole, that prices by wholesalers closely follow the changes in prices by manufacturers, in view of the competition existing between the two groups for the patronage of the retailers.   (2) The indices used did not cover all of the commodities handled by wholesalers, and with the possible exception of the groceries index, the weights could not be selected so as to represent the actual importance of the given goods in the wholesalers' net sales.   This limitation was probably most flagrant in the deflation of the dollar volume of sales by hardware and drugs wholesalers.   (3) The usual defect of any price data is that they cover a limited number of transactions and tend to record not the prices actually charged, but those which the business men asked for the information are willing to give out.   As a result, the "special" deals and prices

[12] See pp. 106-107.

which are fairly numerous, particularly in critical times, were not represented by the price index. But they were reflected in the dollar volume of sales, since the data for the latter were taken from the books of the business firms. We were thus deflating a very exact series of the dollar volume of sales by a less exact index of price movements

It is impossible to estimate quantitatively the element of uncertainty and probable error introduced by the defects of the price data used in the deflation In my opinion, this does not invalidate entirely the results arrived at, especially those which seem substantiated by all the comparisons. This prevents one from putting too much faith in the absolute size of the computed measures, but it does not exclude a reasonable assurance in the conclusions as to the relations between the series measuring the flow of goods in the different branches of economic activity.

The summary statements quoted below are thus all of a provisional tentative character Their ultimate substantiation is made possible only with the accumulation of data for a longer period of time and of a wider scope

The conclusions of the survey are as follows: (1) The fluctuations in the dollar volume of sales series were for the period covered larger than those in the corresponding indices of the physical volume of sales. This was especially true of commodities of such invariable demand as groceries, but much less true in the case of a more variable demand as that for apparel

(2) The correspondence between the movements in the different branches of trade was much closer between the dollar volumes than between the commodity volumes

(3) The correlation between the indices of wholesale commodity sales was much higher than that between corresponding indices of retail sales.

(4) The correlation between commodity sales by retailers and those by wholesalers in the same branch of trade was

greater or smaller according as the physical volume of demand by ultimate consumers was more or less variable.

(5) There seemed to be an increasing rising variability in the flow of goods from one branch of economic activity to another, as we moved further away from the ultimate consumers   Commodity sales by retailers fluctuated the least; those by wholesalers fluctuated more; manufacturing output to a still greater extent.

APPENDIX. *The Methods of Deflation Used and Other Details Concerning the Series and Indices Compiled.*

Groceries

Retail Sales.   The commodities whose retail prices from the Bureau of Labor Statistics quotations were used to make up an index of prices of grocery products were as follows: (1) Bacon; (2) Beans, baked; (3) Bread; (4) Butter, (5) Cheese, (6) Corn, canned; (7) Corn Flakes; (8) Corn Meal; (9) Coffee; (10) Cream of Wheat, (11) Crisco, (12) Eggs; (13) Flour, Wheat, (14) Ham; (15) Lard; (16) Macaroni; (17) Milk, fresh, (18) Milk, evaporated, (19) Nut margarine, (20) Oleomargarine, (21) Peas, canned; (22) Prunes; (23) Potatoes, (24) Raisins; (25) Rice, (26) Rolled Oats; (27) Salmon, (28) Sugar, granulated, (29) Tea, (30) Tomatoes, canned.

The index thus omitted fresh meats and fresh fruits, the bulk of which is presumably sold in stores other than groceries   In absence of any quantitative data on the kind and proportion of goods sold in retail grocery stores, the only method of selection available was an arbitrary rejection of commodities which according to every-day knowledge are sold for the most part in other stores

The individual commodity quotations were given the weights used by the Bureau of Labor Statistics itself in

compiling the index of retail prices of food. The index of the thirty commodities listed above was compiled by the method of aggregatives, with the average month of 1919 as the base. It is quoted fully below.

48   INDEX OF RETAIL PRICES OF 30 GROCERY PRODUCTS

Average Month 1919 = 100

	1919	*1920*	*1921*	*1922*	*1923*	*1924*	*1925*
January	99	114	98	78	81	83	86
February .	92	113	89	78	79	82	84
March ..	93	112	87	75	79	79	83
April .. .	94	117	84	74	78	76	82
May .	96	120	79	75	78	77	82
June .	97	122	79	76	79	78	84
July	101	121	82	77	79	78	87
August	103	113	86	75	79	79	88
September .	102	111	85	76	82	80	88
October . .	104	108	85	78	83	82	90
November	100	104	85	81	85	84	94
December . .	111	102	84	82	84	85	95

The series of the dollar volume of sales (uncorrected), which also has the average month of 1919 as its base, was divided through by this index of grocery prices, and the quotient multiplied in every case by 100. To the index of commodity sales thus obtained a parabolic secular trend (second degree) was fitted by the method of least squares. The equation of the trend, which was computed for 66 months by quarters, was $y = 93.34 + 5.13x + 14x^2$. The trend was eliminated just as in the case of the dollar volume series through dividing each item of the series by the corresponding item of the trend and multiplying the quotient by 100. For the last 17 months a new second-degree parabola was computed (84 months by half-years). The equation is: $y = 76.1 + 14.35x + .196x^2$.

The index of seasonal variations was then computed by the method of ratio-to-ordinate On page 119 it is quoted in comparison with the index of seasonal variations for the dollar

volume series (computed by the *Federal Reserve Bulletin,* see supra, p. 58).

INDEX OF SEASONAL VARIATIONS IN COMMODITY AND
DOLLAR SALES BY RETAIL GROCERY STORES

	Dollar Volume	*Commodity Volume*			*Dollar Volume*	*Commodity Volume*
January	100	98	July . .	98	97
February .	95	97	August .	97	95
March	106	111	September .	97	95
April	101	104	October .	105	102
May . . .	98	103	November	102	97
June	96	99	December	105	101

· The seasonal element was eliminated by again dividing the series already adjusted for the secular trend by the index of seasonal variation.

Wholesale Sales The index of wholesale prices of grocery products was compiled from the quotations of 23 commodities. The weights used were those given by the Bureau of Labor Statistics, but in selecting the quotations for the index an attempt was made to choose them in such a way that the total weight for a given commodity should correspond to the retail price weight (i e, budget quantities), modified by the percentage of the total volume of this commodity purchased by the retail grocers from the wholesalers. These latter data (the percentages) were given by the Harvard Bureau of Business Research in its *Bulletin No. 13,* and by the *Federal Reserve Bulletin* in its articles on the terms of sale in different industries (1919, pp. 1129-1137)

The commodities whose quotations were used were as follows (1) Butter, Cream Extra, Chicago; (2) Cheese, American, Chicago; (3) Cheese, California flats, San Francisco, (4) Cheese, color, average fancy, New York, (5) Coffee, Rio No. 7; (6) Corn Meal, fine white, Decatur, Ill.; (7) Flour Wheat, standard patents, Minnesota, (8) Flour Wheat,

Portland, Oregon; (9) Oleo Oil; (10) Oleomargarine, (11) Peas, canned; (12) Pepper, black, Singapore; (13) Prunes, dried, California, (14) Raisins, dried, California; (15) Rice, Blue Rose; (16) Rice, Honduras Head, (17) Salmon, canned, Alaska red; (18) Salt, American; (19) Soap, Laundry, (20) Sugar, granulated, (21) Tea, Formosa, fine; (22) Tomatoes, canned, (23) Vinegar.

The final weights of some of the commodities which were quoted both in the retail and the wholesale index are as follows:

	Retail lbs.	*Wholesale* lbs		*Retail* lbs	*Wholesale* lbs
Flour .	118	4,560,500	Rice	35	1,088,000
Corn Meal	54	2,667,000	Coffee	40	1,252,434
Sugar	147	7,884,900	Raisins	9	286,075

The price index was computed by the method of aggregatives, with the results as follows:

49. INDEX OF WHOLESALE PRICES OF 23 GROCERY PRODUCTS

Average Month 1919 = 100

	1919	*1920*	*1921*	*1922*	*1923*	*1924*	*1925*
January	95	126	80	61	71	74	86
February	93	123	78	63	73	76	85
March	94	119	79	65	77	79	84
April . .	96	138	72	66	78	76	79
May	99	150	67	66	79	74	79
June .	100	145	66	67	77	72	80
July .	104	136	65	69	74	75	82
August . .	105	124	65	68	71	77	83
September .	100	114	66	66	73	79	82
October .	100	99	64	68	76	83	80
November . . .	103	91	63	70	75	85	81
December	110	82	62	71	75	87	83

The dollar volume series was divided through by this index. Then to the resultant series of the commodity volume of sales (67 months) a straight line trend was fitted by the method of least squares The equation turned out to be y = +

.35x $+$ 95 75. To take account of the last 17 months a trend was computed by the method of semi-averages (see p. 56). The equation obtained was: $y = 108.2 + .08x$. The index of seasonal variations was computed by the method of ratio-to-ordinate (for 63 months ending March, 1924, same period for the trend). This index is as follows: January, 92; February, 87, March, 97; April, 91; May, 96; June, 105; July, 101; August, 102; September, 108; October, 115; November, 109, December, 99.

Production and Stocks. The weights used in combining the separate indices of production and stocks were formed by the products of the average price of the given commodity in 1919 multiplied by its weight in the index of wholesale prices. This gave the following weights: Oleomargarine, 1197; Milk, evaporated, 3 216, American Cheese, 1.176; [13] Wheat Flour, 5.238, Sugar, 7.018, Rice, 1.067.

The equations of the trend for the index of production were respectively: $y = 94.55 + .05x$; and $y = 108.3 + .31x$. For the index of stocks $y = 109.89 - .09x$; and $y = 102.6 - .17x$.

The index of seasonal variations (ratio-to-ordinate for 67 months) was for the production series: January, 80; February, 89; March, 103; April, 110; May, 117; June, 115; July, 115; August, 112; September, 97; October, 98; November, 85; December, 75.

For the series of stocks the same index was· January, 102, February, 92; March, 90; April, 91; May, 91; June, 94; July, 96; August, 101; September, 105; October, 112; November, 117, December, 109.

Department Stores and Dry Goods

Retail Sales. To compile an index of prices of products sold in department stores two groups of series were used.

[13] For the index of stocks the weight of cheese was reduced to 500.

First, the indices of retail prices of clothing, of furniture and house furnishings, and of the miscellaneous group published by the Bureau of Labor Statistics   These indices were weighted each by the percentage of sales which the corresponding commodity formed in the total dollar sales of department stores (survey by the National Retail Dry Goods Association, see supra, p 8).   The price indices were recomputed to a new base, the mean of December, 1918, June, 1919, and December, 1919, having been taken as 100.   The first index of retail prices of department store goods runs then as follows:

1919			*1920*			*1921*		
June	.	94	June	.	125	May	....	100
December	.	116	December	.	115	September	.....	88
						December	. .	84

			1922	*1923*	*1924*
March	. .	. . ..	81	81	82
June	.	. .	79	81	81
September		. . . .	79	82	
December		.	79	82	

The other more detailed price index was obtained by compiling the series of prices of clothing and that of sundries, both published by the National Industrial Conference Board. Both series were shifted to a new base, the average of March, July, and November, 1919, having been taken as 100.   The two series were again weighted in the same manner as the three series of the Bureau of Labor Statistics.   Their total weight formed somewhat over 60% of the net total sales of department stores, with the clothing index having a weight of 67% out of the total 100%.   The combined index thus obtained runs as shown on page 123.

The dollar volume series was divided through by this index, and a series of the commodity volume of sales was thus arrived at.   A secular trend was fitted, taking only the figures for every March, July, and November (in order that

50. INDEX OF RETAIL PRICES OF CLOTHING AND OF
SUNDRIES

N I C B. Mean of March, July, November, 1919 = 100

		1919	1920	1921	1922	1923	1924	1925
January	.. . .		124	100	87	87	93	92
February	.. . .		126	94	87	87	93	91
March	.. . .	92	127	94	85	90	93	92
April	.. .. . .		131	92	86	89	93	91
May	. . ...		131	92	86	92	93	91
June	. .		128	90	85	90	92	92
July	.. .	98	124	91	85	90	90	92
August	. .		121	89	85	90	92	92
September	. . ..		121	89	86	92	92	93
October	. .		119	89	86	92	93	93
November	. ..	114	113	91	87	92	92	93
December	. .		106	88	85	92	92	93

the 1919 items could be included). The equation of the trend
is $y = .68x + 95.94$. For the index as deflated by the Bureau
of Labor Statistics figures the equation of the trend fitted
by half-yearly periods (for 67 months) was $y = 7.15x + 89.15x$ (starting point June, 1919). For the last 17 months
a trend was fitted by the method of semi-averages. The equa-
tion obtained was. $y = 140.2 + .67x$.

The index of seasonal variations in this deflated depart-
ment stores series was found to vary only a little from the
index of seasonal variations in the dollar volume of sales,
hence the latter index was used.

Wholesale Sales (dry goods wholesalers). To compile an
index of prices of goods sold by dry goods wholesalers the
indices of the wholesale prices of the following sub-groups
were used. cotton goods, woolen goods, both as given by
the Bureau of Labor Statistics.[14] The indices were, however,
modified by excluding commodities which seemed to have
been given weights in excess of their importance in the sales
by wholesalers, and by adding commodities from other sub-
groups. Thus both cotton and woolen yarns were excluded,
while blankets and carpets were added. The index finally
arrived at runs as shown on page 124.

[14] See *Monthly Labor Review*, July, 1924, pp. 80-89.

51. INDEX OF WHOLESALE PRICES OF COMMODITIES SOLD BY DRY GOODS WHOLESALERS

Average Month, 1919 = 100

	1919	*1920*	*1921*	*1922*	*1923*	*1924*	*1925*
January .. .	95	128	79	66	74	79	77
February	88	134	73	66	76	78	77
March .	82	136	69	66	77	77	77
April	80	136	67	65	79	76	77
May . . .	84	136	66	66	79	76	76
June . .	92	133	66	68	78	77	75
July	99	130	66	68	77	77	75
August .	102	126	65	69	76	78	76
September .	120	114	67	69	76	76	75
October .	125	104	70	72	77	76	75
November . .	113	98	69	74	79	77	75
December .	119	94	68	75	80	77	76

The dollar sales series was divided through by that index. A straight line secular trend was fitted to the resulting commodity sales series by the method of least squares (by months for 63 months). The equation of the trend turned out to be $y = +51x + 97\,58$. It was eliminated in the usual way To take account of the last 17 months, a separate trend was computed by the methods of semi-averages. The equation obtained was $\cdot\ y = 122\,8 + 30x$

The index of seasonal variations was again computed by the method of ratio-to-ordinate with the following results: January, 96; February, 94; March, 105; April, 96; May, 94; June, 96; July, 100; August, 124; September, 121; October, 108; November, 90; December, 75 The seasonal variations were adjusted in the usual way.

Production. In compiling the index of consumption of cotton and wool I gave to each of the two series the total weight attributable to the cotton or the woolen group in the index of wholesale prices used above, this weight multiplied by the average price of 1919. The resulting products were: For the cotton series—14 110 837; for the woolens—8 342 367. The equations of the trends for the two periods respectively were: $y = 92.41 + .29x$, $y = 104.9 + .18x$.

Shoes

Wholesale Sales. The price index was taken directly from the series published by the Bureau of Labor Statistics in the *Monthly Labor Review* of July, 1924 (pp. 80-89). The base was shifted from 1914 to the average month of 1919.

The secular trend for the deflated series is $y = -.14x + 89.62$ (for 67 months by months by the method of least squares). The index of seasonal variations for the same series (ratio-to-ordinate method) runs as follows: January, 74, February, 85, March, 116; April, 107; May, 102; June, 98, July, 82, August, 114; September, 122; October, 124; November, 97, December, 79.

Production. The Department of Commerce index of shoe output was extended back of November, 1921, with the help of data on percentage changes in production of 33 manufacturers in the Chicago Federal Reserve District and of 42 manufacturers in Philadelphia Federal Reserve District (see the monthly bulletins of the respective Federal Reserve Banks). The output of the former group was in January, 1922, somewhat above a million pairs, of the latter, around 800,000. The weights given to the two districts were adjusted in such a way that for the period covered by the full Department of Commerce index the movement of the combined output in the two districts should be in close correspondence to the changes in the more complete series. These weights turned out to be. Philadelphia, 3, Chicago, 1. Evidently, the latter district had to be given a smaller weight because its data represented for the most part big manufacturers.

Other Series of Wholesale Sales

Drugs. The index of wholesale prices was compiled from the quotations of the following commodities: (1) Acid, Citric, (2) Acid, Tartaric, (3) Alcohol, Denatured, (4) Cream of

Tartar, (5) Epsom Salts, (6) Glycerine, refined, (7) Perox-
ide of Hydrogen, (8) Phenol, (9) Opium, (10) Quinine
Sulphate. It was computed by the method of aggregatives
with the results as follows:

52   INDEX OF WHOLESALE PRICES OF DRUGS AND   •
PHARMACEUTICALS

Average Month, 1919 = 100

	1919	1920	1921	1922	1923	1924	1925
January	108	103	99	91	100	102	101
February .	106	104	97	91	100	102	101
March	103	104	95	90	107	102	101
April	98	105	93	90	109	100	101
May	99	105	92	90	109	99	100
June	98	110	91	90	107	99	101
July	97	112	91	90	101	99	101
August . .	98	112	90	92	99	99	101
September . .	98	115	90	95	99	100	100
October . .	98	113	89	97	98	101	100
November .	98	111	90	101	98	101	102
December . ..	98	100	90	101	99	101	102

The series of the dollar volume of sales was divided through
by this index. To the resulting commodity sales series a
straight line secular trend was fitted (67 months) by the
method of least squares The equation of the trend turned
out to be $y = .18x + 100\ 02$ The trend for the last 17 months
was $y = 111.5 + .16x$ The index of seasonal variations was
computed by the method of ratio-to-ordinate with the follow-
ing results: January, 99; February, 95; March, 111; April,
97; May, 96; June, 98, July, 96, August, 101; September,
106; October, 113, November, 97; December, 91.

Hardware The Bureau of Labor Statistics gives prices and
weights of hardware goods for the following articles (whole-
sale): (1) nails, wire; (2) wire, plain, (3) wire, barbed, (4)
pails, galvanized; (5) tubs, galvanized; (6) knives and forks,
(7) carvers, stag handle. But besides these, for the years
1919-22, monthly quotations were given for the following
commodities· (1) butts, loose pin, wrought steel; (2) files;

(3) hammers, Maydole; (4) trowels; (5) wood screws, (6) locks, common mortise; (7) doorknobs, steel, bronze plated; (8) chisels; (9) augers, (10) vises; (11) shovels; (12) saws, Disston. But for none of these twelve commodities were any weights given. Two indices of prices were compiled, one for the seven weighted commodities, the other for the twelve unweighted The final index was formed of these two for the years 1919-22 (an arithmetical mean of both), of the weighted one for the years following, linked with the preceding years through chain relatives This final index runs as follows.

53 INDEX OF WHOLESALE PRICES OF HARDWARE GOODS

Average Month, 1919 = 100

	1919	1920	1921	1922	1923	1924	1925
January	. 102	113	111	86	88	99	94
February	. 102	113	109	84	91	99	95
March	99	113	105	85	93	99	95
April .	97	116	102	83	96	99	93
May .	. 96	117	101	83	98	98	92
June .	. 96	117	99	83	98	97	89
July .	96	118	95	83	98	96	88
August	98	120	91	85	98	94	88
September	98	121	91	86	98	93	88
October	101	119	92	88	100	92	88
November	. 103	117	91	88	100	92	88
December	111	111	94	88	99	94	88

The series of sales in terms of dollars was divided through by this index. To the resulting series of commodity sales a straight line secular trend was fitted (67 months) by the method of least squares The equation was found to be $y = +.13x + 93\ 64$. The equation of the trend for the last 17 months (by the method of semi-averages) was: $y = 109\ 3 + 34x$ An index of seasonal variation was computed by the ratio-to-ordinate method with the following results. January, 84, February, 81, March, 105; April, 107; May, 109, June, 108, July, 99, August, 104, September, 106; October, 110; November, 99, December, 89.

Meats. The wholesale prices of meat products were taken directly from the series published by the Bureau of Labor Statistics in its *Monthly Labor Review* of July, 1924, pp. 80-99. The base was shifted from 1914 to the average month of 1919.

No secular trend was fitted to the commodity sales series, since the latter covers only three years and a half. An index of seasonal variations was, however, roughly computed, with the results as follows: January, 103; February, 99; March, 97; April, 94; May, 99; June, 99; July, 100; August, 100; September, 103; October, 113; November, 95; December, 98.

General Index. The series of commodity sales by all the wholesalers was computed as a weighted average of the separate series, each uncorrected. The weights were identical with those used by the *Federal Reserve Bulletin* in its compilation of the index of the dollar volume of sales by all wholesalers.[15] They were: groceries, 41; meats, 24, dry goods, 13; shoes, 6, hardware, 6, drugs, 5.

The secular trend of the general index was found to be (fitted as a straight line to 67 months by the method of least squares) $y = .28x + 94.42$. The trend for the last 17 months (computed as the line of semi-averages for 84 months) was: $y = 104.9 + 10x$. The index of seasonal variations was computed by the ratio-to-ordinate method with the following results January, 94; February, 89, March, 102; April, 95; May, 97; June, 102; July, 98; August, 107; September, 111; October, 114; November, 101; December, 90.

[15] See *Federal Reserve Bulletin,* April, 1923, pp 439-442

CHAPTER III

(U. S., 1919-25)

IN the comparisons drawn above we were observing the changes in the volume of goods as they appeared at the end of the manufacturing process, the flow of the commodities from wholesalers to retailers, from retailers to ultimate consumers. But these ultimate consumers themselves, when buying from the retailers, are enabled to do so only because at some time previous they have sold some article or service and thus acquired the means with which to procure goods from the retail stores. To the flow of money from the ultimate consumers to the retailers there must correspond a flow of money incomes to the consumers It would be interesting to study this distribution of money incomes and purchasing power and thus complete the circle of the flow of means of payment and of goods which constitutes the substance of the processes of money economy.

The main purpose of this survey of incomes and the purchasing power of consumers is to account for the comparative evenness of retail sales. It was observed above that the volume of retail sales, when measured either in terms of commodities or money, displayed cyclical fluctuations appreciably smaller than those present in the sales by wholesalers or in the manufacturing output of the same commodities. This situation under the conditions of money economy, in which every ultimate consumer is the recipient of an income from the industries or trades, may seem strange. If the participants in the process of production or trading receive a share proportional

to the volume of business done, then the incomes of the
ultimate consumers would fluctuate in exact correlation with
the fluctuations in the general volume of trade and produc-
tion   Furthermore, if consumers are spending money as fast
as they are getting it, we ought to expect that the flow of
money into the retail trade, or in other words, the volume of
sales in the retail trade would produce cyclical fluctuations
very similar to those in the general volume of trade   What
causes then the even character of the movements in the volume
of retail sales?

There were two suppositions in the paragraph above: first,
a perfect correlation between the volume of business (sales
and output) and the incomes disbursed; second, the expenses
of consumers in purchasing were assumed to be in perfect cor- ·
respondence to the amount of income received.   But are these
assumptions true?   Let us test them with the statistical data
at our disposal.   This test should provide an explanation of
the even character of retail sales, as well as supply valuable
comment on some of the theories of business cycles, which
make this maladjustment in the flow of the volume of pro-
duction, disbursements, and savings the main generator of
cyclical fluctuations

In the following comparisons we shall limit ourselves to
the body of consumers living in the cities   This is advisable
since the main body of the data on retail trade refers to stores
located in cities.   Also, the series on the monthly flow of in-
comes refer mainly to urban population

These incomes can be grouped roughly under four head-
ings: (1) wages, (2) salaries, (3) interest and dividends, (4)
business profits.   These groups can be taken up one by one and
compared: (1) with the volume of manufacturing output or
the general volume of trade, (2) with the volume of retail
sales

The flow of wages could best be measured by the series
indicating the total amount of money disbursed.   An index

most suitable for such purposes is published currently by the Federal Reserve Board—the index of pay rolls.[1]   The series adjusted for the secular trend and the seasonal variations runs as follows:

54. INDEX OF PAY ROLLS IN MANUFACTURING INDUSTRIES

(1919-1925)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January . .	96	123	88	78	104	108	98
February .	90	121	88	81	107	114	103
March	89	126	87	81	111	111	102
April	90	125	85	81	113	110	100
May .	89	126	82	83	115	103	99
June .	93	129	82	87	116	99	98
July	97	126	79	86	114	93	97
August	101	126	80	89	112	91	98
September .	103	120	77	90	110	100	94
October	100	116	77	94	113	94	100
November	105	108	76	98	111	94	101
December .	112	98	78	100	108	96	99

—— Factory Production
---- Factory Payrolls
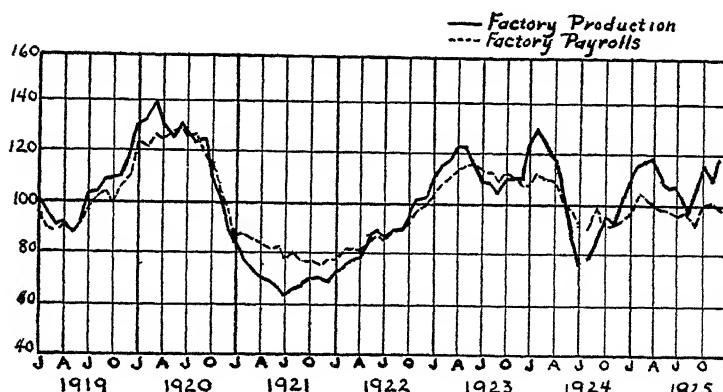
34   Factory Pay Rolls (in Dollars) and Dollar Volume of Manufacturing Output, 1919-1925

[1] See *Federal Reserve Bulletin*, 1925, pp 330 and 669, and the current issues.

This index is represented on the chart on page 131 by the heavy black line. The dash line represents the dollar volume of output computed as follows. The index of manufacturing production of the Federal Reserve Board [2] was used. This index describes the physical volume of output in many branches of manufacturing production, and seems to be the most complete index of its kind. To obtain the dollar volume of output, a series of wholesale prices had to be chosen as an inflator. For this purpose, the index of wholesale prices of consumers' goods was selected (which includes 199 commodities, and is compiled by the Federal Reserve Board). The selection of this index would lead to an underestimation of the fluctuations in the dollar volume of output, since the production index covers many branches supplying producers'. goods, and the latter are subject to greater price fluctuations. In multiplying the output series by the price index, a lag of two months for the former has been assumed. The reason for this lag is that current production is ordered at prices current at the time of the order. The assumption of two months' lag was arbitrary, for there seem to be no systematic data on the subject. The comparison of a simultaneous multiplication with the one allowing for the two months' lag shows no substantial difference between the two.

The series describing the dollar volume of manufacturing output was thus arrived at, and adjusted to isolate the cyclical fluctuations. The price index follows on page 133.

The comparison of the series of wage disbursements with the index of the dollar volume of manufacturing output shows one unmistakable fact: the volume of wages did not change in rigid correspondence to the volume of output, and thus the ratio of the former to the latter was variable. During the periods of prosperity (1919, 1920, 1923, 1924) the index of output rose above that of wages disbursed, in the periods of depression (1921, 1922, 1924) it fell below the latter. The

[2] *Federal Reserve Bulletin,* March, 1924, p 188, and current issues.

CYCLICAL FLUCTUATIONS

55. THE DOLLAR VOLUME OF MANUFACTURING PRODUCTION

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	100	130	83	73	111	121	111
February	96	134	77	75	115	131	115
March	91	140	74	78	119	121	117
April	92	134	72	79	122	118	118
May	89	126	71	87	122	103	110
June	92	131	67	89	116	90	107
July	103	129	63	87	110	92	109
August	103	123	66	89	109	79	97
September	108	125	68	90	105	89	108
October	109	110	71	95	111	96	117
November	109	101	71	101	111	93	112
December	117	89	70	103	111	103	118

ratio formed by the wages in the total value of current production declined through the largest part of the period of prosperity, increased through the largest part of the period of depression

This also means that the volume of wage disbursements was subject to smaller cyclical fluctuations than the dollar volume of output The standard deviation for the former is 13 6, for the latter 19.5.

We thus find that the first assumption stated above does not hold, that the incomes distributed by the industrial enterprises did not move in strict accordance with the changes in the total returns, or volume of output. The wages disbursed fluctuated less, and this accounts partly for the discrepancy observed between the fluctuations in retail sales and those in wholesale trade and production.

Let us now compare the same wage disbursements or total pay rolls with the dollar volume of sales in retail stores, choosing among the latter groceries and department stores as the most important ones. (See chart, p. 134.)

The chart shows that in this comparison the wage disbursement series is the most variable. It is now the latter index which rose during the period of prosperity above that of

retail sales, and declined much below it during depression. This is also indicated by the respective standard deviations, which are again 13.6 for the wage disbursements index, 10.6 for the sales by groceries, 6 3 for the sales by department stores.

This comparison seems to suggest that the wage-earners did not spend money in exact proportion to the volume they re-
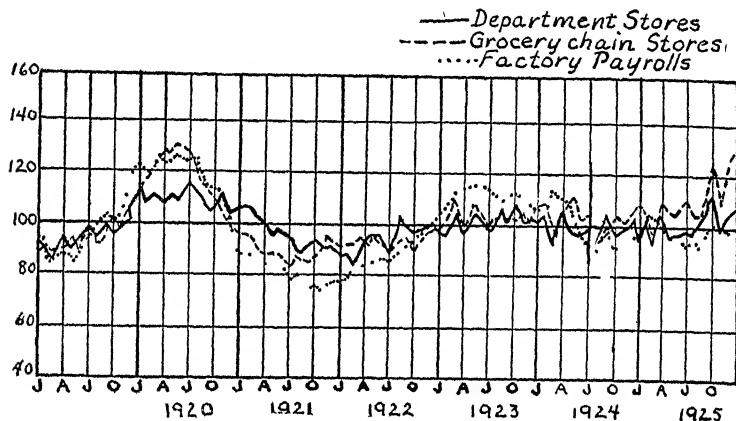
35   Factory Pay Rolls (Dollars) Dollar Sales by Grocery Chain Stores and Dollar Sales by Department Stores, 1919-1925

ceived, or that at least they did not so spend it in any type of stores whose sales were depicted by the series surveyed above. It will be remembered that of these only three showed fluctuations larger than those in groceries. These three were: mail-order houses which are patronized mainly by farmers, music chain stores which supply a luxury demand; and dry goods chain stores index whose standard deviation is still smaller than that of the wage disbursement series. In all other branches of retail trade the cyclical fluctuations were appreciably smaller than those in groceries, and thus much smaller than in the wage disbursements.

If we consider the demand in these branches of trade as a

demand for necessaries, this comparison would imply that the ratio of current income spent by wage-earners on necessaries varied with the business cycle, declining in time of prosperity, increasing in time of depression.

As to the disposal of the other portion of the fluctuating income, we possess no data [3] None of the retail trade series (except mail-order houses) has a standard deviation larger than that of the wage disbursements index. Thus none of these indexes could be used to explain the disposition of the increased wages, unless it be supposed that the effective demand of some other part of the population did not increase as much as the total volume of retail sales.

One series might, however, shed some light on a source which is drawing off a part of the residuum of the income remaining after the demand for necessaries is satisfied This is the index of savings, a series which could be extended back only to January, 1920 [4] It is based on reports from national banks having separate savings accounts, as well as from mutual savings banks and joint-stock savings banks. For the largest part of the period covered the index is based on reports from 700-800 banking institutions Adjusted as usual the series follows on page 136.

An inspection of this series reveals a curious fact: the volume of savings deposits is comparatively high in the beginning of 1920 It then declines towards the month of September of that year, to rise again to what might be considered the peak in January, 1921. The period of decline

[3] Of the different groups of expenses of wage-earners, rent seems to be one of the most important This item fluctuates very little, and we have reason therefore to assume that subtracting this nearly constant item from the varying total, we leave a residue more fluctuating than the total wage or salary received This would make still larger the difference noted above between the amplitude of retail sales movements and that of payroll disbursements

[4] The series cover for January-April, 1920, Philadelphia Federal Reserve District; May, 1921, to date, 12 Federal Reserve Districts, May, 1920-May, 1921, 7 Federal Reserve Districts Data from the *Survey of Current Business*.

56. SAVINGS DEPOSITS

Adjusted for the Secular Trend

	1920	1921	1922	1923	1924	1925
January	102	103	98	100	101	100
February	102	102	97	100	102	101
March	102	102	98	100	102	101
April	101	101	97	100	103	100
May	101	100	97	100	101	101
June . . .	101	101	98	101	102	102
July . . .	101	99	97	101	101	100
August	101	99	97	100	101	100
September	100	98	96	101	101	100
October . .	101	98	97	100	$\overline{100}$	100
November . . .	101	97	97	100	99	100
December . . .	102	98	99	102	101	100

begins in this series only in February, 1921, a lag which was not observed even in the standard banking and money market series, which usually lag well after all other indices of business movements. The same unusual lag can be observed in 1923-24 with the index of savings deposits beginning to decline only in May, 1924.

36 Savings Deposits, 1919-1925
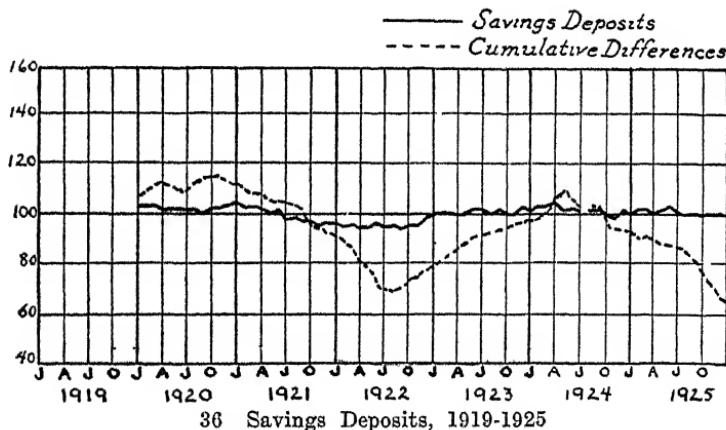
The dash line on the chart above may suggest an explanation of this lag. This line represents the cumulative differences between the wage disbursements and the sales by

groceries. The items of the latter series were subtracted from those of the former and the differences cumulated The resulting index represents supposedly the increase or decrease in the residual part of the income, which residuum forms a source of the savings. It runs as follows:

57. CUMULATIVE DIFFERENCES BETWEEN WAGE DISBURSEMENTS AND GROCERY SALES

	1920	1921	1922	1923	1924	1925
January	+ 39	+ 54	— 47	— 96	— 1	— 32
February	+ 46	+ 46	— 58	— 91	+ 7	— 33
March	+ 54	+ 41	— 70	— 90	+ 22	— 30
April	+ 50	+ 37	— 80	— 77	+ 27	— 37
May	+ 48	+ 30	— 90	— 70	+ 21	— 44
June	+ 47	+ 23	— 97	— 60	+ 17	— 51
July	+ 44	+ 19	— 101	— 46	+ 6	— 64
August	+ 53	+ 10	— 104	— 35	+ 2	— 70
September	+ 58	0	— 108	— 27	+ 3	— 80
October	+ 65	— 12	— 104	— 16	— 7	— 103
November	+ 66	— 26	— 103	— 10	— 14	— 109
December	+ 62	— 33	— 101	— 3	— 23	— 124

On the chart on page 136 the line of normal was taken as zero with every space unit representing 10 units of the cumulative difference item.

The correspondence between the two lines is very close. The series of cumulative differences rose through the first two months of 1920, declined toward July, and started to rise again (two months earlier than the savings deposits), reaching a peak in November, 1920, again two months earlier than the savings index. After that point the movements in the two lines were simultaneous: they both reached their troughs in September, 1922, and both had their record peaks in April, 1924. In 1925, however, the movements of the two differ, which may arise partly from the fact that the straight line trend did not fit well the series of the dollar volume of grocery sales.

The reason for the similarity is obvious. The savings

can be made only after the needs for such necessaries as groceries are satisfied One should expect then that savings will decrease or increase as the combined movement of incomes and grocery expenses leaves a larger or smaller residual from which to save [5]

While the analysis of the savings series revealed this illuminating correspondence with the index of cumulative differences between wage disbursements and retail grocery sales, it contributed nothing to the problem of explaining the even character of retail sales. Were the series of savings to show larger cyclical fluctuations than the index of wages disbursed, it would mean that the residuum left over for purchases moves more evenly than the flow of income. This would have brought us one step nearer to accounting for the even character of retail sales. But the series of savings shows very small fluctuations, and thus the amount of income spent in purchases fluctuates presumably more than the volume of total wages disbursed.

To sum up the conclusions of the survey so far:

(1) The industrial enterprises did not disburse in wages a constant ratio of the dollar volume of output The ratio was declining through the largest part of the period of prosperity, and increasing through the largest part of the period of depression

(2) The wage earners did not spend in necessaries a constant proportion of their fluctuating incomes, but rather a more stable absolute amount

(3) The savings displayed changes correlated with the movements in the proportion of the wages left over after the demand for necessaries (groceries) had been satisfied.

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[5] The residuum shown in the comparison must not be conceived as an absolute one The dash line shows an increase or decrease in the ratio of income spent on groceries, and not a change in the absolute amount spent Thus the residuum must be conceived as a changing ratio of the wages received.

The translation of the comparison into terms of commodities would show that conclusions (1) and (2) hold true also for the flow of purchasing power disbursed, for the physical volume of output, and the commodity volume of retail sales.

The same series of total factory pay rolls was deflated by the Index of the Cost of Living of the National Industrial Conference Board.[6] The index thus obtained follows:

58. PURCHASING POWER OF FACTORY PAY ROLLS, U S

#### (1919-1925)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	109	118	85	79	106	102	93
February	107	111	85	84	108	108	99
March	103	114	87	85	111	104	96
April	100	111	86	86	113	104	94
May	98	113	86	88	116	100	95
June	101	111	86	93	114	93	91
July	106	112	85	93	116	90	94
August	104	110	85	95	111	90	92
September	108	109	81	96	108	90	89
October	104	105	81	100	111	93	94
November	108	101	81	104	109	92	94
December	111	96	83	106	107	95	95

As should have been expected this index of distribution of purchasing power shows appreciably smaller fluctuations than the series of wage disbursements   The standard deviations are 12 6 and 16.0, respectively.

On the chart on page 140 the dash line represents the index of manufacturing output compiled by the Federal Reserve Board (see above). It has been adjusted for the secular trend and the seasonal variations.

Here the comparison leads one to our former conclusion The industrial enterprises did not distribute to their wage workers purchasing power in constant proportion to the

[6] For 1920-1925   For 1919 a special index, compiled by the A T & T. Co and quoted by Berridge, W. A , *Purchasing Power of Consumers*, p 104
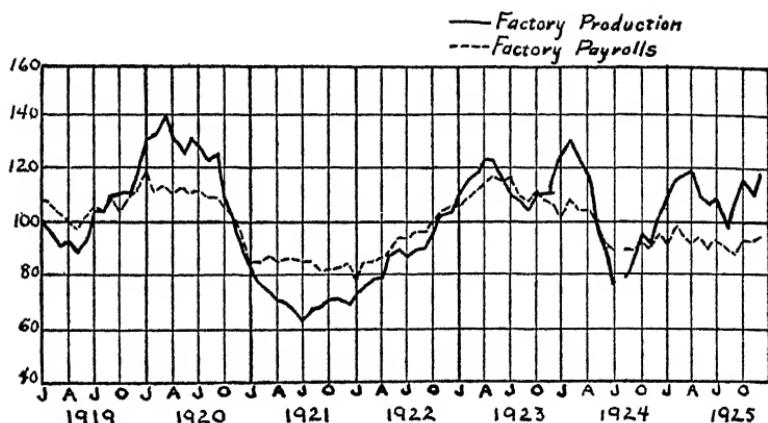
37 Purchasing Power of Factory Pay Rolls and Commodity Volume
of Manufacturing Output, 1919-1925

## 59. INDEX OF MANUFACTURING OUTPUT

(Commodities)

Adjusted for the Secular Trend and the Seasonal Variations

	1919	1920	1921	1922	1923	1924	1925
January	113	120	76	82	113	109	102
February	107	122	76	86	116	119	103
March	100	118	77	89	117	107	100
April	104	112	76	89	118	104	101
May	98	108	75	97	118	91	94
June	101	108	77	100	112	82	93
July	110	105	74	98	106	85	97
August	111	101	79	98	108	81	86
September	112	103	81	99	104	91	95
October	110	94	83	105	110	95	102
November	112	88	85	113	106	92	99
December	120	84	82	114	105	91	105

volume of goods produced. This proportion was declining
through the period of prosperity, rising through the period of
depression. Disregarding the difference in quality of com-
modities and the question of time lag, one might say that the
manufacturing establishments changed the proportion of

their current product which they enable their wage-earning employees to absorb from the market.

If we compare again the disbursement of purchasing power to wage-earners with the commodity sales by groceries (see chart below), we shall find justification for our second conclusion. The wage-earners did not spend a constant pro-
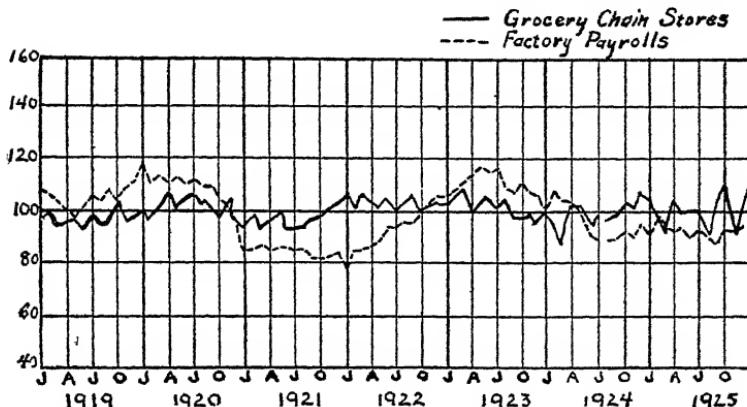
38 Purchasing Power of Factory Pay Rolls and Commodity Sales by Grocery Chain Stores, 1919-1925

portion of the purchasing power received in the purchase of food. They varied this proportion so as to make the satisfaction of the demand for necessaries much more stable than the flow of their real income. The standard deviations of the two series are 10 3 and 4 5

The comparison of wage disbursements with retail sales was confined only to the field of grocery sales since in no other branch are we as sure of the preponderance of the demand by wage-earners. The situation differs in all other branches of retail trade, where the demand by other classes of population is more important, and where its movements could neutralize the changes in the demand by wage-earners This limits our conclusion as to the comparative stability of workers' expenditures to the field of foods alone.

The monthly data at our disposal referred to pay-roll disbursements to factory employees   But the latter are only a part of the consuming public receiving current incomes from the industries and trades.   There are first, the employees working in branches of business activity other than manufacturing production   And secondly, there are the entrepreneurs and investors who receive their income in the form of interest, dividends, and drawings upon the business

There are no published data (monthly) on pay rolls in branches of activity other than factory production.   But we can still find quantitative data tending to show that on the whole, the total disbursements of wages and salaries are likely to display cyclical fluctuations of a more even character than those in factory pay rolls.   This would account partly for the fact that sales in retail trade move more evenly than the pay-roll series described above.

According to the estimates of national income by the National Bureau of Economic Research, there were the following big groups in the total amount of wages and salaries disbursed. (1) Factories, 5,890 million dollars out of a 19,450 million dollar total in 1913, (2) government, 1,470 million dollars, (3) parkways, 1,416 million dollars; (4) construction, 1,276 million dollars, (5) mining, 718 million dollars [7]   Of these only one group, mining, through the years of 1909-1918, showed fluctuations in the amount of wages and salaries disbursed greater than those in the factories.   All other groups showed smaller fluctuations, especially low ones in government disbursements.

The same picture is revealed by the more detailed study of the 1920-1922 cycle by Dr. W. T King.   In his book "Employment Hours and Earnings in Prosperity and Depression —United States 1920-22," in the table LI (p. 104) he shows that the biggest maximum cyclical decline in the total quarterly wages and salaries paid took place in the group of "all

[7] See *National Income in the U. S.*, Volume II, p. 242, Table 20 E

factories'' (37.5%), with the next largest in the group of ''extraction of minerals'' (36.3%) In all the other branches, commerce and trade, construction, government, the decline was appreciably smaller

This evidence, although not conclusive, leads one to believe that the total distribution of wages and salaries including all the different branches of trade, production, transportation, and service fluctuates somewhat less than the disbursement by factories alone. This would mean then that the discrepancy in the amplitude of fluctuations between pay rolls and the sales in the various branches of retail trade is not as great as it would seem from the comparison above.

Wages and salaries are usually grouped together and there seems to be no definite data on the movement of salary disbursements alone. In one case we are, however, enabled to compare the estimates of the total ''salaries and officials'' and of the ''pay of manual and clerical employees'' by years through the period of 1909-1918.[8] The salaries in this case are conceived less inclusively than usually, since they do not include the payments to clerical workers The comparison of the two estimates shows that the salaries of officials fluctuated much less than the wages of manual and clerical employees

We find the same evenness in the movements of salaries of factory office workers compared to changes in earnings of shop workers in New York factories.[9]

For interest and dividends we are fortunate to have a series giving the total monthly amounts disbursed by industrial and other business corporations. This series, compiled by the *Journal of Commerce,* claims to cover the total disbursements in the country. It runs from 1913, but for

[8] *Income in the United States,* Volume I, Table 19, p 99, National Bureau of Economic Research
[9] *Industrial Bulletin,* December, 1923, November, 1924, pp. 34, 66.

the purpose of present comparison it was taken only for the years beginning with 1919. The series runs as follows:

60. TOTAL INTEREST AND DIVIDENDS DISBURSEMENTS

Adjusted for the Secular Trend and the Seasonal Variation

	1919	1920	1921	1922	1923	1924	1925
January	99	107	93	91	111	99	103
February	102	102	100	98	98	102	105
March . . .	101	100	101	99	96	105	104
April . .	105	102	98	97	97	97	97
May . . .	104	102	99	98	99	119	119
June	64	103	103	98	97	98	99
July	99	102	99	97	100	106	111
August . .	100	102	97	97	100	101	103
September	99	101	98	98	101	118	115
October	109	103	97	93	98	97	100
November . .	105	102	97	98	95	101	103
December . . .	111	107	96	98	85	86	89
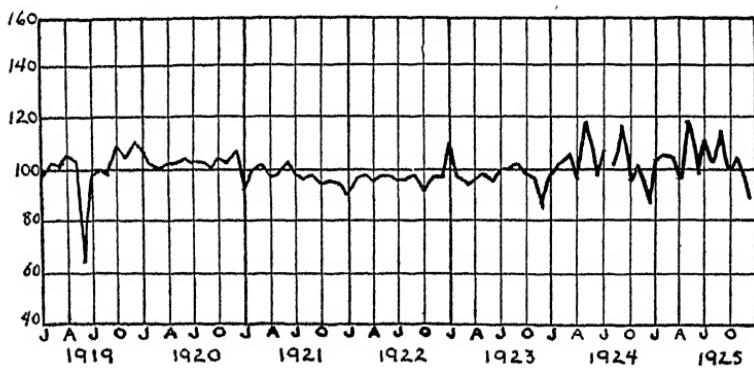
39. Total Interest and Dividends Payments, 1919-1925

The striking feature in the series is the evenness of its movements, the attenuated character of the cyclical fluctuations, if such can be traced at all [10]   This is not surprising

[10] The addition of 1924-25 data indicates that the fixed seasonal index used was not satisfactory, since there evidently was a change in the seasonal factor. Thus the last three Decembers show unusually low points, the Septembers and Mays points too high. That will exaggerate the standard deviation of the series

since a part of the payments is formed by disbursement of interest, which must be paid regularly if the enterprise is to continue solvent. But even so dividends comprised in 1919 about 80 million dollars (monthly average) out of the total of 266 million dollars.

There was one big break in the series of an obviously random character in June, 1919. When it is excluded the standard deviation of the series is 6.0, (its inclusion magnifies the 6.0 to 7.1). Even without any graphical comparison the following two conclusions appear obvious:

(1) The disbursement of interest and dividends by the business corporations ran much more evenly than their volume of business Whether we suppose these business establishments to be manufacturing concerns, mining, or transportation companies, or even trading establishments, the fluctuations in their production or sales were larger than those in the series of interest and dividend payments.

(2) The flow of income to the recipients of interest and dividend payments was much more even than that to the wage-earners and thus should have stabilized considerably the total volume of incomes distributed. The exact degree of this stabilizing influence depends on the importance of this source of income in the total income of the community.

The indications are that with this even flow of interest and dividend payments in money form, the purchasing power thus disbursed fluctuated in a manner inverse to the cyclical fluctuations in business conditions. It would not be correct to deflate this series by the index of the cost of living, since it might be reasonably supposed that the budgets of the bulk of people receiving interest and dividends are essentially different from the budgets of working-men for which the cost of living index is compiled. But were we to deflate it we should be sure to observe that the distribution of purchasing power in form of interest and dividend was low

and declining through the period of prosperity, high and rising through the period of depression.

In this respect this type of income was the reverse of wages and salaries. As observed above, factory wages and salaries, even when measured in terms of commodities (purchasing power), rose during prosperity and declined during depression. Here then we have another source of distribution of purchasing power, the flow from which moved in a direction different from that of the flow of wages and thus made for a stabilization of the total volume of the power to buy received by the consuming public.

If we classify the regular drawings of the entrepreneur proprietor as salary expense, then business gains may be defined as the sum left over after all the expenses (cost of raw materials or merchandise included) have been deducted from the gross revenue of the enterprise. How were these business gains moving through the different periods of the business cycle? By mere speculation on the subject one is led to believe that the cyclical fluctuations in the net business gains must have been very considerable, indeed larger than the fluctuations in the total volume of business itself. It was observed above that the bulk of operating expenses of an industrial enterprise, i e , wages, salaries, interest moved more evenly than the volume of business, rising much less during prosperity and declining less during depression. This would mean that other expenses assumed stable (for the time being), the business gains, the residual difference between the volume of gross return and of expenses rose greatly during prosperity, fell considerably during depression. And since profits have a much smaller absolute magnitude than either the expenses or the gross returns, the difference in fluctuations between those two items will mean very violent and appreciable ups and downs in the movement of business profits.

This speculative conclusion would, however, be contradicted by the movement in the group of expenses we assumed to be constant, i e , the cost of raw materials. With the prices of raw materials fluctuating more than prices of the finished goods, this part of the expenses could be expected to fluctuate more than the volume of gross returns, thus ironing out somewhat the residual difference between gross profits and net profits. It must not be forgotten here that there is a lapse of time between the acquisition by the entrepreneur of raw materials and the complete transformation of these raw materials into the finished goods, which allows a speculative gain in time of uninterrupted prosperity and which makes for a speculative loss during depression.

The question of the amplitude of fluctuations in business gains or net profits is, then, a problem of balancing on the one hand the difference between the expenses which are of a more "overhead" character against those which are less so, both kinds being compared with the variability of the gross output of the business. Most of the theories of the business cycle assume that the balance is in favor of declaring the volume of net profits to be variable, more so than the gross volume of business

Whatever scanty statistical data exist pertinent to this question seem to indicate that the net earnings did fluctuate more than the gross earnings. Thus in regard to public utility corporations, the comparison of the standard deviations for the respective series taken annually for 11 years (1913-1923) presents the following picture:

THE VARIABILITY OF GROSS REVENUES AND NET EARNINGS
BY PUBLIC UTILITY CORPS COMPARED

	Standard Deviations of Gross Earnings	*Standard Deviations of Net Earnings*
Railroads (Class I)	8 3	37.3
Telephone Companies	3 3	8.7
Gas and Electric Companies	4 2	6.1
Telegraph Companies ...	5.8	10.5

But a comparison of the gross and net earnings in public utility companies is hardly to the point since the former differ in their price policy from the bulk of industrial and mercantile concerns, and the movements in their net earnings had hardly any correspondence with the movements in gross earnings.

Data on business gains of industrial and mercantile establishments are of only a fragmentary character For big industrial corporations (57) the Federal Reserve Bank of New York summed up the profits as recorded in the semi-annual balances, with the following results: [11]

PROFITS OF 57 INDUSTRIAL CORPS (1920-23)

	($00,000)	Relatives
1920—1st half	2,141	100
1920—2nd half	1,174	55
1921—1st half	877	41
1921—2nd half	250	12
1922—1st half . .	1,520	71
1922—2nd half	1,610	76
1923—1st half	1,965	92

It should be noted that these corporations are evidently the biggest concerns of their kind, the yearly average for 1920 being approximately six million dollars of profits. Without any definite data on the output of these corporations, it may be noted that a decline of 88% in output from the first half of 1920 was observed in no branch of industry.

We have also some scattered data on business gains of mercantile concerns In the *Harvard Business Review* (Jan., 1923, pp 212-25) in an article entitled, "The Readjustment of Retail and Wholesale Operating Expenses," Mr. Fraser cites data for a period of years on expenses and profits of mercantile establishments. Among these are the comparisons shown on page 149.

NET PROFIT OR LOSS IN RETAIL STORES

(Net Sales = 100)

	1918	1919	1920	1921
Shoe Stores				
(73 identical firms)	+ 7.0	+ 8.1	+ 1.7	− 1 3
Jewelry Stores				
(35 identical firms) . ..	n.d	+ 6 5	+ 4.7	− 4.6
Department Stores				
(149 identical firms) . .	n d	n.d.	+ 1.7	+ 1.3

In the department stores we find no substantial decline in profits, although even here the decline was more substantial than in the dollar volume of sales by the 359 department stores treated above (see chap. 1). In the shoe stores and in the jewelry stores, if we assume the average of the four and three years, respectively, as 100, the decline in net profits was from 208 in 1919 to 44 in 1920 in the case of shoes, from 295 in 1919 to 200 in 1920 in the case of jewels. In 1921 both groups of stores suffered losses, a decline such as could never take place in the dollar volume of sales.

For one branch of wholesale trade this article quotes both net sales (dollar volume) and net profits for a period of years. The data follow:

SALES AND PROFITS BY 43 (42) WHOLESALE GROCERY FIRMS

		Net Sales 000	Net Sales Relatives	Net Sales Link Relat	Profit or Loss 43 Firms— 100 Net Sales
1916		$1,339	100	.	+ 3 3%
1917	.	1,677	125	125	+ 4 2%
1918	. .	1,902	142	114	+ 2 1%
1919	. . .	2,294	171	120	+ 2 2%
1920	.	2,585	193	113	− 0 8%
1921	. .	1,758	131	68	− 2.3%

Here again we have a case of a net loss appearing, and for that reason we must conceive of net business profits as fluctuating much more than the volume of business done. It can also be observed that in these cases of mercantile estab-

lishments, as well as in the case of industrial corporations the decline in gain appeared at approximately the same time with the decrease in the volume of business, which was decidedly not the case with the public utility companies.

On the whole, it may be concluded that business profits, meaning by these the net gains of industrial and mercantile establishments, fluctuated more than the dollar volume of business and moved in the same direction with the latter through the largest part of the periods of depression and prosperity. We have here then one source of income which fluctuated much more appreciably than the volume of retail sales Might one say that it made for a greater variability in consumers' demand, contributed a force disrupting the evenness that had been imposed by a comparatively even distribution of wages and salaries, interest and dividends?

To connect business gains directly with consumers' demand seems to me dubious. Business gains are not a source of income in such a simple and direct way that whenever they appear, they are instantaneously transferred to the pockets of the proprietors of the enterprise and there become a fund for current consumption. In the case of a corporation, business profits become purchasing power in the hands of ultimate consumers only through payment of dividend and interest In the case of personal establishments, the proprietor usually draws his income in the form of weekly sums, which are likely to be much the same whether gains are realized for the period or not. True, in time of depression, these periodical drawings may be scaled down, but then they are treated like salaries of other employees, or rather with more care since they imply the comforts of life and the stability of the budget of the proprietor himself.

It would be absurd to assume that the fluctuations in business incomes are reflected fully in an equally changeable income flow to the holders of an equity right in the enterprise In the case of wealthy *rentiers* and investors, its greatest in-

fluence would be felt in changing the budget in those elastic parts which can be hardly reflected in the sales by the branches of retail trade treated above   In the case of smaller owners, like wholesale and retail dealers, we can assume the flow of the periodic income as fairly regular and only slightly dependent on the current flow of net gains   These weekly drawings are treated rather as expenses, and the business gains (as they probably are considered in the data of the *Harvard Business Review*) are the final residual coming to the dealer in his capacity as an owner, after his recompense as an active entrepreneur.

The variability of business gains can hardly result in a variability of the volume of demand by the recipients of these gains or the bearers of these losses.   It thus hardly disturbs the regularity which we were trying to explain, the conditions which would show how in the money economy, with fluctuating production and trade, the consuming public found it possible to exercise effective demand in the more or less even fashion revealed by the series of the volume of retail sales.

It was found that wages and salaries disbursements moved much more evenly than the volume of output   That the payments of interest and dividends revealed only slight cyclical fluctuations and finally, that though business gains seemed to have fluctuated very appreciably, this could not affect to any great extent the consumers' demand for necessaries and semi-luxuries.

Note   The great variability of net business profits seems to be a reason for assigning to this movement a strategic importance in the explanation of the business cycle problem   True this high variability may be conceived, as it was above, as a result of the difference in the amplitude of fluctuations of volume of output and the total expenses. But it must not be forgotten that once realized business gains become a stimulus for and a fund of new expansion   Though the commitments of business men are based mainly on the forecast of the future, the results of past performance in the form of net profits or net losses accrued are a very important factor in his outlook as to the future, and facilitate or make more difficult the carrying on of his activity.   In

the case of public utility companies, with the movement of net earnings sometimes in the opposite direction from the general movements of business conditions, these fluctuations in net business gain assume a new and telling importance.

In attempting to complete the circle. retail trade, wholesale trade, production, retail trade, we might take into consideration one more factor· the possibility of retail sales on credit. Of all the branches of retail trade considered above, this would probably be most important in the sales of groceries. Many of them, and especially those which supply the working population, are not on a cash and carry basis. It is thus possible that in times of severe depression, with unemployment and a considerable reduction in the total volume of wages disbursed to working-men, we might have purchases from groceries on a credit basis. How important this factor is cannot be estimated in absence of any data on the subject.

The main conclusions of our survey so far are to be as follows·

(1) The industrial enterprises were distributing wages, salaries, dividends, and interest in a more even fashion than that followed by the total volume of output.[12]

[12] This conclusion might be given greater weight by quoting the data on operating expenses of retail and wholesale concerns   Quoting again from Mr. Fraser's article, we observe that the ratio of operating expenses in the net sales changes with the change in business conditions, diminishing in years of prosperity, increasing in time of depression.

OPERATING EXPENSES IN RETAIL STORES (NET SALES 100)

	1918	1919	1920	1921
Shoe Stores (73 inde firms) ..	25 2	24 9	26 3	28 3
Jewelry Stores (35 inde. firms)	n d.	33.9	34.7	43 1
Dept. Stores (149 inde firms)	n.d.	n.d	25 7	27 7

A great increase in the ratio of operating expenses in the net sales could be observed in 1921—the year of depression. This means that

(2) The ultimate consumers were saving but the movements of small savings were not large enough to account for the fact that sales by retail stores moved more evenly than factory payroll disbursements.

Of these two conclusions the latter does not need much explanation. The desire to save must be accorded just as much recognition as the craving to satisfy any other wants. It is then small wonder that with the cyclical fluctuations in business life, the disbursement of wages and salaries rises to higher levels, the amount saved also rises, while with the decrease in earnings the amount saved diminishes.

The first conclusion seems to be of great importance In part it was asserted by some as one of the main factors in making for cyclical fluctuations in business. Thus in his book "Cost and Profits and Their Relation to the Business Cycle," Mr Hastings points out the tendency of American corporations to adhere to a conservative policy of dividend payments, so making their flow much more even than the movement in the volume of output released by the same enterprise on the market. He, however, asserts that wages, salaries, and interest are being disbursed "currently," not implying that there is any discrepancy between the flow of these and the changes in the output.

The statistical data surveyed above cover only seven years and only two very peculiar business cycles in the United States. They lend factual weight to Mr Hastings' assertion on the conservative distribution of dividends, and they give

the expenses, i e , wages and salaries disbursements, rent, etc., were not reduced as much as the total volume of business done

The same can be observed in the operating expenses of wholesale grocery firms:

OPERATING EXPENSES OF 143 WHOLESALE GROCERY FIRMS

	1916	1917	1918	1919	1920	1921
Operating expenses (% of net sales)	10.0	9.3	9.4	9.3	9 0	12.3

rise to a belief that even wages and salaries are also distrib-
uted rather conservatively, that they are not raised as much
during prosperity as the value of output.[13] But the data alone
do not allow for any valid statistical induction to that effect.
Have we any *a priori* reasons to suppose that the business
enterprises would be likely to disburse wages and salaries
evenly on the whole, that they would keep their distribution
more stable than the volume of output released on the mar-
ket?

To find these reasons one must go beyond the apparent
variability of the volume of wages and salaries, and see exactly
how this variability is being brought about. Is it the rates per
hour of work that declined so much, hours of work per week,
or the number of employed? The data brought out by the in-
vestigation of Dr. King may throw light on what happened
during the prosperity and depression of 1920-22 in the United
States (see table on page 155).

The data quoted show that in making for the decrease of
total wages and salaries paid during the period of depres-
sion (1921-22) the main cause of the decrease was in the
diminished number of employees on the pay roll   This latter
series shows a decline greater than either the average amount
of hours worked per week by an employee or the average
earning per hour of employee   In "all industries" the index
for the total number of employees declined from 107 to 90,
in "all factories" from 102 to 76. But the average amount
of hours actually worked per week per employee declined only
from 100 to 96 ("all industries"), from 100 to 92 ("all fac-
tories").   The average earnings per hour per employee
showed the same small decline   In the case of "all indus-

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[13] It must not be forgotten though that wages disbursed to-day are
paid for making goods which will not reach the retail markets for
several months   This point is discussed below, see infra, Chap. IV,
pp. 190-191.

61 WAGES AND SALARIES, NUMBER OF EMPLOYEES, AND HOURS WORKED IN "ALL INDUSTRIES" AND "ALL FACTORIES" IN THE U. S   1920-22 BY QUARTERS.   INDEX DATA [14]   1ST QUARTER OF 1920 = 100.

	1920 Quarters				1921 Quarters				1922 Quarters
All Industries	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
1. Total wages and salaries	100	106	111	105	89	86	85	85	82
2 Total number of employees on pay roll	100	104	107	101	91	90	92	91	89
3 Total hours actually worked	100	104	107	99	87	88	90	88	86
4. Hours worked by employee per week	100	100	100	99	96	97	97	97	97
5 Average earnings per hour per employee	100	104	104	106	102	98	95	96	96
All Factories									
1 Total wages and salaries	100	103	104	95	75	69	66	65	65
2 Total number of employees on pay roll	100	102	102	94	82	78	76	77	77
3 Total hours actually worked	100	100	101	91	76	72	71	72	73
4 Hours worked per employee per week	100	99	99	96	92	93	93	94	94
5 Average earnings per hour per employee	100	102	102	103	98	95	93	90	88

tries'' there was a drop from 106 to 96, in the factories from 103 to 88.   In other words, the diminution of wages and salaries was achieved mainly through the dismissal of a considerable number of employees, rather than through decreasing the rate of pay, and only slightly by allowing the remaining employees to work a smaller number of hours per week.

A partial confirmation of the same fact can be found in the comparison of data on total pay rolls with those on average weekly earnings per employee on the pay roll.   Taking annual data for the factories in New York State one finds the following.   (See p 156.)

[14] W I. T King, "Employment, Hours, and Earnings in Prosperity and Depression, U S., 1920-22," original absolute data, pp 30, 55, 87, 104, 113.

62. TOTAL PAY ROLLS AND AVERAGE EARNINGS PER WEEK
IN THE FACTORIES IN THE STATE OF NEW YORK

Adjusted for the Secular Trend [15]

	1914	15	16	17	18	19	20	21	22	23
Total pay rolls ..	100	87	97	101	113	111	127	85	84	95
Average earnings ..	100	90	89	90	117	107	119	100	91	93

As should have been expected, the average earnings fluctu-
ated less than total pay rolls (see chart), although the dif-
ference was not as appreciable as one would think from the
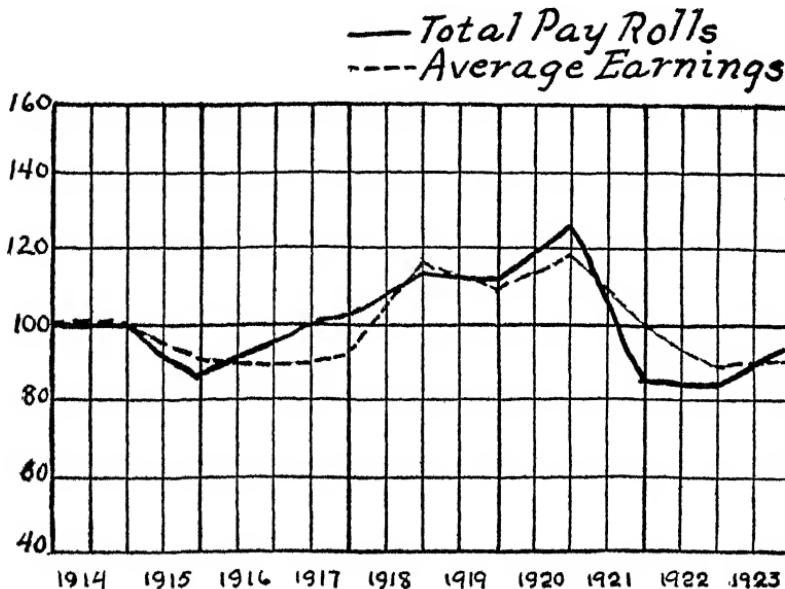
40   Total Factory Pay Rolls and Average Earnings, N. Y. State,
Annually, Adjusted Indices, 1914-1923

table quoted on p. 155 for the years 1920-22. It is to be
noted that average earnings followed the total pay rolls on

[15] Secular trend in both cases was a second degree parabola fitted by
the method of least squares. The equations were: for average earnings,
$y = 100 + 15.05x$ (coef. of $x_2 = 0$); for total pay rolls, $y = 100 - 0.61x_2 + 33.82x$.

the rise better than on the decline. It may be due to the fact noted by Dr King that the average earnings were kept up during depression by the retention of the more highly paid employees.[16] But still it is obvious that here, also, the earnings of the employees who continued to be employed did not decline greatly, and offered resistance to the process of depression.

The same is to be observed in a similar comparison for Wisconsin factories.[17] The series follows:

63 TOTAL PAY ROLLS AND AVERAGE EARNINGS IN WISCONSIN FACTORIES

(Yearly Averages—Relatives)

Adjusted for the Secular Trend [18]

	1915	16	17	18	19	20	21	22	23
Total pay rolls	53	74	90	116	126	150	83	90	114
Average earnings	62	72	83	104	115	137	107	103	112

On chart, page 158, we see the average earnings rising in a much more even fashion than the total volume of wages and salaries disbursed. The same condition could be observed in respect to the railroads.

We are likely to narrow considerably the problem with which we started, if instead of asking why it was that the total volume of wages and salaries tended to move more evenly than the output, we ask why it was that the average earnings per hour per employee and the total amount of hours actually worked declined so little during depression. This explained, we would know why it was that the total volume of wages and salaries disbursements moved more evenly. The root of the matter lies in the different move-

[16] *Ibid*, p 113, note d

[17] Original data from the survey of *Current Business*, November, 1924, pp 150-151.

[18] Secular trend—a straight line fitted in both cases by the method of least squares The equations were· for total earnings, $\bar{y} = 213 + 3x$; for average earnings, $\bar{y} = 170.8 + 2\,9x$.

ments of wage and salary rates as compared to the movements in wholesale prices.

As to the causes of the comparative evenness in the number of hours an employee is actually working we can only surmise. The most obvious reason is that it is better for an employer to have one worker employed full time than two
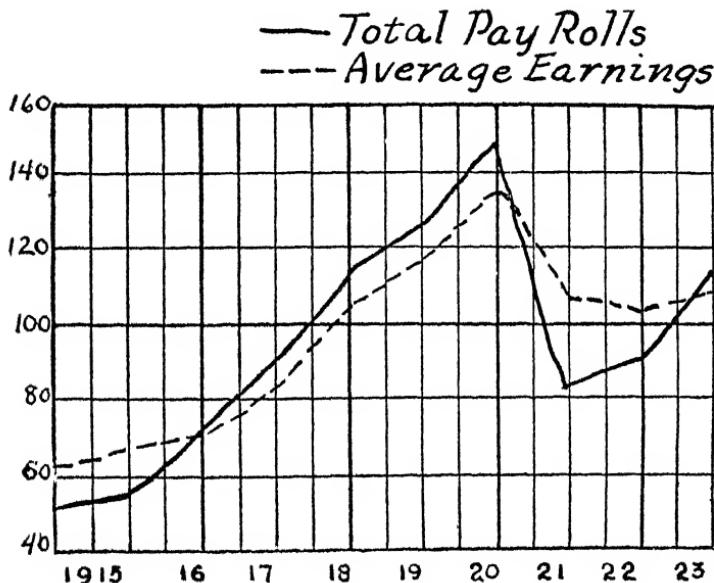
41. Total Factory Pay Rolls and Average Earnings, Wisconsin, Annually, Adjusted Indices, 1915-1923

employed half time With the first arrangement he can select a smaller group of workingmen to man his enterprise, and select carefully, thus improving the quality standards of his working force. But aside from this opportunity to choose, a small number of fully employed workers offers many other advantages. It is easier to handle and govern as a body, and the supervising personnel can either be reduced or expected to deliver more efficient service. The fully employed worker

himself is supposedly more efficient than a part-time worker. If the latter holds two jobs (which is rare), he wastes time and energy in changing from one to another. If he is only partly employed, he is not in good condition financially, which somewhat impairs his efficiency as a worker A full-time employee can be expected to show more concentration on the job, be more satisfied materially, and evince loyalty to the company which retained him in time of depression. For these reasons, the employers are disposed to curtail their forces by dismissing the less efficient workers and to leave as many working full time as will satisfy the current demands of the enterprise.

On the other hand, an employer may want to prevent the drifting away of his workers to other employment and their getting out of his reach. If this happens he cannot build up his force quickly, if large business comes in again, although at the same time he may rely on the available supply of free hands in the neighborhood

The policy of reducing the force is facilitated because the employer does not bear any penalty for dismissing his employees If unemployment insurance were established and the employers' dues levied proportionally to the rate of turnover in his plant, there would be in existence a check (if possibly ineffective) upon this dismissal of employees in bad times   As it is, except in branches of industry with strong unions, there seems to be no organized pressure on the employer to prevent him from so doing, a pressure which in many branches of production exists against any attempt to scale down the rates of pay or underemploy the persons on the pay roll

The comparative stability of the average earnings of the employees per unit of time is a phenomenon not as easily explained, although one noticed for a very long time. The cause may lie in the extraordinary resistance which the workingmen exhibit whenever they can against any reductions

in their wage rate. The worker's point of view toward his labor is entirely different from the business man's to his merchandise. The latter will sell at reduced prices whenever he is convinced that no immediate rise can be expected and that he will be able to repurchase his stock at the low prices established. The worker will consent to a reduction of rates only if there is no better alternative, feeling that it will be a costly struggle to raise the rates to the former level. He makes no calculation of the sale of his labor and the new purchase, and even when he compares his returns with the reduced cost of living, he finds no reason for any rate reduction. In most families he is not alone gainfully employed, although he may be the biggest earner Loss of employment by one of the subsidiary earners will affect the income part of the budget in such a way that any reduction of rate with the following diminution of the roll (of the head of the family) will mean an impairment of the customary standard of living, or encroachment upon the hoardings, or some other painful recourse. But even aside from this fact, the workman is apt to consider any lowering of pay as an act of encroachment upon his vested rights, a malevolent lowering of the value of the commodity which he possesses In some fields, as Dr. King noted (see *Ibid.,* pp. 23-24), workers refused to accept lower wages after the crisis of 1920, and the employers had the alternative either to continue paying the old rates or of closing the factories. On the other hand, in branches of industry where the employers are strong and the workers not organized, one observed considerable reduction in rate of payments (e.g., see the rates of the U. S. S. C.).

The main cause of this even movement of wage rates (and salaries as well) is that human labor after all is a peculiar commodity It is not detached from the owner and does not change hands quickly The proceeds of its sale form a source of man's livelihood and too often the only important source.

Its sale is a determination of the value of the workers' stock of labor as a property, and thus means more to him than the sales of merchandise to the professional trader or producer.   The workers must both work and bargain, hence they are more conservative in this latter operation than the wholesaler, dealer, or the modern manufacturer whose main task is bargaining   All this in combination makes for a slow readjustment of wages and salaries as well as the comparative stability of the rates of payment.

We are at the end of our survey of the movement of incomes in their relation on the one hand to the changes in the volume of output and trade, on the other, to their bearing on the movement of sales in retail trade.   The survey dealt with so many questions that a complete treatment was impossible. The main tentative conclusion was, however, arrived at: the industrial enterprises were distributing wages, salaries, dividends and interests in a much more even flow than that exhibited by the total volume of industrial output.   Its provisional character need not be stressed: it was shown clearly by the fragmentary character of the data quoted in their support.   It was strengthened as far as was possible within the limits of this work by a further analysis and some argumentative reasoning   But it goes without saying that a conclusive proof must wait for new data and more thorough analysis

CHAPTER IV

DIFFERENCE IN THE AMPLITUDE OF CYCLICAL FLUCTUATIONS IN VARIOUS BRANCHES OF BUSINESS ACTIVITY EXPLAINED

I

In the preceding chapter we tried, if somewhat unsuccessfully, to account for the even character of the cyclical fluctuations in the volume of retail sales. The problem before us now is to see whether there are any reasons that would lead one to expect a larger variability in the volume of whole-sale sales and of production. The statistical data quoted above indicate that through the years 1919-1925 in the United States wholesale sales and manufacturing output did show cyclical fluctuations larger than those in the retail sales. But the data do not suffice for a valid statistical induction. The presentation of arguments which would lead one to expect such a difference in the amplitude of fluctuations would both strengthen and extend the validity of the conclusion arrived at above, and also explain the nature of that phenomenon.

The problem is made puzzling by the fact that mere speculation would, at the outset, lead us to assert the necessity of strict and rigid correspondence between retail and wholesale sales, wholesale sales and manufacturing output without any allowance for a different variability. The chain of reasoning that leads to such an assertion would be approximately as follows:

In the existing money economy the purchase and production, i e, the acquisition of goods is carried on by a business man not for the purpose of consuming them in the satisfaction of his own wants, but for the purpose of reselling with profit. It is this satisfying of a profit-yielding demand which

is the ultimate goal of business activity, as well as its most efficient regulator To the manufacturer this profit-yielding demand is presented by the purchases from him by the wholesalers (and retailers), to the wholesaler—by the purchases from him by the retailers, to the retailer—by the purchases from him by the ultimate consumers One might expect then a close running together of the flow of goods from one link in the distributive system to another, since every lower stage leading down to the consumer presents presumably an effective check upon any mistake in the forecast of the future demand that the business men in the stage preceding it might have made

Hence the most that one could have expected in the close-knit system of sales-purchase relationship are occasional, random fluctuations in one flow as compared to the other, with a check coming in more or less promptly The phenomenon of a continuous difference in the amplitude of fluctuations between the flow of goods in the different stages of the process of distribution seems to go directly counter to the close correspondence that is to be created by the manifold ties of sales-purchase which bind together the business enterprises in the modern money economy And, if one has to explain this phenomenon, the reasons given must work through this process of close inter-connection and not in disregard of it.

Past investigations of business cycles have been emphatic in pointing out the difference in the amplitude of fluctuations between the output of consumers' goods and the output of producers' goods. In the explanations given of this phenomenon one might find a clew as to the reasons why one should also expect a larger variability in the volume of wholesale sales as compared to the retail, in the volume of output as compared to the wholesale sales.

The latest explanation of this larger variability in the demand for equipment as compared to the demand for consumers' goods is given by J. M Clark in his book, ''The

Economics of Overhead Cost.'' From this latter I quote an example illustrating the explanation (see pp 391-2):

" . . . A hypothetical manufacturing industry in which equipment is equal to twice the amount of the value annually produced by the manufacturing process—a typical proportion. If this equipment lasts twenty years the annual replacements will equal 10% of the annual value product . . . changes in prices are ignored.

"In the first year the primary demand (i e , the demand for the finished goods of the hypothetical industry assumed in the case, m. n.) is stationary. In the second year it rises 5% In order to furnish 5% additional equipment (Clark here evidently means finished product), however, the output of equipment would have to be doubled, and two dollars' worth of extra equipment would have to be made for every dollar's worth of extra finished product turned out In the third year, primary demand grows 10% more (figured on the original amount as base) and the derived demand is now three times the original amount In the fourth year, primary demand stops growing, with the result that the derived demand (i e , for the additional equipment) not merely stops growing, but falls back to its original amount, or one-third of the maximum which it had just reached In the fifth year, primary demand falls 10%, and derived demand now falls to less than nothing; and so on . . .''

This is the explanation in its simplest form Could it not be applied to the case of retail and wholesale trade? Could we not conceive the retail store and the dealer's office and warehouse as manufacturing establishments where sales are produced, where equipment must exist with the help of which sales are to be made?

It seems at first glance reasonable to compare the stocks of retailers and wholesalers to the equipment of the manufacturers: They both are the necessary means of producing the finished product. The similarity is heightened by the

circumstance that also in the retail and wholesale business there seems to be the definite concept of a ratio between the equipment and the current sales. The reference here is to the rate of turnover, the rate which also determines the ratio between the amount of merchandise stocks on hand and the volume of current sales If the rate of turnover for a year is three, i e., if the cost of merchandise sold for the year is three times as large as the value of the average inventory of stock, this means that it takes one-third of a year to sell an amount equal to that of average stocks In other words, seasonal variations being eliminated, the ratio of stocks to monthly current sales is 4 to 1

If this proportion is kept, and if it is considered that in order to produce an increased amount of sales we need to increase the amount of stocks so that the ratio of 4 to 1 is not violated, we get the same picture as in the case of the derived demand for industrial equipment This is easily illustrated by a hypothetical example.

64 CONNECTION BETWEEN PRIMARY AND DERIVED DEMAND IN RETAIL SALES AND PURCHASES ILLUSTRATED

	Stocks at 1st of Month	Sales During the Month	Old Stocks at End of Month	Stocks Required to Maintain 4-1 Ratio	Purchases Required to Maintain 4-1 Ratio
1st month	400	100	300	400	100
2nd month	400	100	300	400	100
3rd month	400	105	295	420	125
4th month	420	105	315	420	105
5th month	420	115	305	460	155
6th month	460	100	360	400	40
7th month	400	95	305	380	75
8th month	380	95	285	380	95
9th month	380	100	280	400	120

Rate of turnover, if we assume three additional months (stocks—400, sales—100), will be $r = \dfrac{1215}{\frac{4860}{12}} = \dfrac{1215}{405} = 3$

Note For much of this illustrative example I am indebted to Professor W C. Mitchell, who improved it while looking over the manuscript

The example of the table above implies the following assumptions: (1) that the ratio of stocks to current sales is kept constant—this assumption is essential; (2) that the seller supposes the sales of the next month to be equal in volume to the sales for the month just passed—this assumption omitted, we could still prove that with an *expected* change in sales (no matter what is the basis of the expectation) the change in purchases will be a magnified reflection of the former, (3) that monthly purchases are to provide for the sales of the next month.

The table reveals the following peculiar features: (1) When the sales rise unexpectedly 5%, the purchases to satisfy the conditions stated must rise 25%; (2) when the sales stop growing, purchases not only stop growing but decline from 125 to 105; (3) when sales decline right after the peak, purchases fall off tremendously, (4) if the rate of decline in sales diminishes, the purchases not only stop declining but may begin even to grow as they did in the table from 40 to 75

We thus get here the same relationship of fluctuations as in J. M Clark's example, only in a much more marked form, since we assumed the ratio of equipment to output (stocks to sales) to be 4 to 1, and not 2 to 1, and have magnified the results by the assumption number 2. If accepted as applicable, this hypothesis would explain the larger variability of wholesale sales and manufacturing output The size of the difference in the amplitude of fluctuations would be made to hinge upon the rate of turnover, being small where this rate is high and large where the rate is low It would show that a small change in retail sales will generate a much greater change in wholesale sales, and through the latter a still greater change in manufacturing output. On the contrary, a mere retardation in the change of retail sales might cause a fluctuation in the opposite direction in the derived demand, i.e., in the sales by wholesalers and by manufacturers.

But is the hypothesis true? Can it be accepted on the basis of other evidence at our disposal? The crux of the question is whether we are true to reality when we assume the ratio of stocks to current sales to be constant. Could it not be that larger sales are made with the same stocks, the increased demand of consumers manifesting itself in an easier and quicker choice from the same volume of goods? On the other hand, with an expected decrease in sales, could the stocks be reduced to the full amount of the expected decline, i e , magnified by the accepted ratio?

With the question formulated in this way it becomes obvious that the hypothesis in the hard and fast form as stated above will not hold. The rate of turnover does not remain constant through the cyclical fluctuations in business. In Mr. Fraser's article already quoted above,[1] we find the following data on the rate of turnover in retail stores and by wholesale firms.

RATE OF TURNOVER IN RETAIL STORES

	1918	1919	1920	1921
Shoe Stores (73) . .	1.6	1 7	1 8	1.7
Jewelry Stores . ..	n d.	1 0	0 9	0.8
Department Stores .. .	n d.	n.d	3 4	3 3

In 43 wholesale grocery firms the rate of turnover was changing as follows:

	1916	1917	1918	1919	1920	1921
Rate . .	. 6 0	5 9	5.2	5.0	6 3	5.1

The data show that the rate of stock turnover does fluctuate although not very appreciably But even were this rate to be shown constant by the data, it could hardly prove the correctness of our hypothesis. Since there might have been a rise in the retail sales *following* the rise in wholesale and

[1] *Harvard Business Review*, January, 1923, pp 212-225

not the reverse, with the ratio of the volume of sales to the inventories remaining the same

There are several reasons against accepting the ratio of stocks to sales as a rigid one, and against supposing that an increase or decline in current sales will cause an instantaneous, magnified reaction in the volume of purchases They can be summed up briefly as follows·

(1) There is a certain elasticity in the service which the same volume of stocks can offer in sales   With the same amount of merchandise on the shelves, the volume of sales can fluctuate within rather wide limits   The lower limit would be the one which can be borne by the enterprise through bad times without incurring too much loss in the expenses of carrying idle stocks, a limit which in many cases can go down pretty low. The upper limit would be that volume of sales which does not impair the stock condition to such an extent that there is an appreciable falling off in incoming sales because of limited choice   These limits can be fixed only empirically, and practically they are rarely allowed to be reached, the retailer or wholesaler adjusting his stock so as to avoid the expenses of carrying idle merchandise on shelves or to avoid the loss of prospective customers   It is to be seen, however, that the limits are rather wide and allow for an appreciable variation of the ratio of stocks to expected sales

(2) In the illustration above we were assuming a month as a time unit   But if we wish to consider the stocks as equipment, would it not be better to take the day as a unit? The results arrived at would be somewhat different.

The increase of sales means merely an accelerated rate of outflow of goods per unit of time. If the time unit taken is small, the increase of sales for that unit would not be appreciable enough to affect the sufficiency of existing stocks for the purpose of selection. If the stocks are replenished frequently enough, one may need to supply only the defi-

ciency made by the increased sales without any provision for additional stocks.

To illustrate the statement by an arithmetical example: If the ratio of current stocks to monthly sales is 4 to 1, the ratio of the same stocks to daily sales will be 100 to 1 (counting 25 days in a month). If now the daily sales increase from 1 to 1.05 or by 5%, the daily purchases which are to be made in order to keep constant the ratio of stocks to sales will have to be increased from 1 to 6 05 or by 505% But we must notice that with the increase of sales by 5%, the ratio of stocks to sales changed from 100 to 1 to 100 to 1.05, a change too insignificant to result in any limitations of choice to the ultimate consumers If the retailer replenishes his stock every day, he may increase his purchases by 5% only and adhere to the new ratio of 100 .1.05 without any great inconvenience to his trade

It is only when we assume longer time intervals for measurement, that the percentage changes in current sales become of great importance and reach a size where increased stocks may be needed to provide the same variety of choice as before. True, the magnifying ratio of stocks to sales then becomes smaller, but it assumes more vital importance. By increasing the frequency of his purchases, the retailer and wholesaler can avoid the necessity of replenishing stocks in large quantities. He also reduces the additional stock necessary to take care of a substantial increase in sales

This would imply that the influence of an expected change in sales on purchases would vary with the degree of assurance that the business-man-seller has of getting promptly, frequently, and without any increased cost, an additional supply of commodities that he finds necessary to purchase. Thus, even if the rate of turnover is very low, say once a year, the increase in sales would not reflect itself in any magnified increase of stocks, if by the nature of business and under the existing conditions the retailer or the wholesaler can promptly

replenish his shelves without much additional cost for the small volume of his purchases and without any delays in deliveries   As we shall see later, this is one of the reasons why a prospective difficulty in getting goods promptly or the anticipation of an easy purchase plays such an important rôle in determining the purchasing policies of retailers and wholesalers in their attempt to prepare themselves for the expected volume of sales.

(3) It must be noted that the changes in the physical volume of retail sales and even of sales by wholesalers are small in many branches of trade   It is doubtful whether these cyclical changes when small are noted by the business men. It was observed above that the average size of a cyclical fluctuation in the physical volume of retail grocery sales was, · for the period covered, only 45% of the "normal." True, individual fluctuations may be and were larger than that. But after all, is this a phenomenon noticeable enough to suppose that the average retailer would take it into consideration and make it a factor in his expectation of the future course of sales?   While we might expect such careful and rational response on the part of big department stores and chain-store systems, we could hardly expect it in the case of the small dealers   This would put a rather serious limitation on the hypothesis that *any* change in sales will give rise to a magnified change in purchases.

(4) There is another limiting circumstance to be considered.   Stocks cannot be increased beyond a certain limit because the space and service conditions of the store do not permit.   On the other hand, the retail store must always provide a certain kind of standard service, and stocks cannot be reduced very much   There is a certain stock of goods, of standard commodities of standard sizes, which the customer has a kind of common law right to require from the store, and the current stock must include a sufficient assortment of all such commodities.   A store caring for its trade name can-

not omit these goods from its shelves. This makes the carrying of stocks to an appreciable extent an overhead cost.

All these limitations must be taken into consideration before the above hypothesis is accepted if only as giving one of the reasons that would lead us to expect the cyclical fluctuations in wholesale sales to be larger than in the retail, in manufacturing output larger than in the wholesale sales. What could really be said is, that provided the changes in sales are substantial enough and are expected to continue in the future, the purchase by the sellers in replenishment of the stocks would tend to be larger than the changes in sales themselves. Whether the difference between the two changes will be large or small depends on the seller's prospects of getting without additional cost a frequent and prompt supply of merchandise, and on the elasticity of the stocks in providing service for a varying volume of sales.[2]

So far, we have been considering the effects of an expected change in sales on the purchasing policy of the different groups of business men   The second important factor that might influence this purchasing activity is the expected price or cost of the merchandise in the future.

In planning his future activity the modern business man has to consider not only the prospective sales but also the prospective cost of merchandise, since he gets his profits as the difference between gross returns and expenses.   The largest part of the latter is the cost of merchandise to the retailer or wholesaler himself, and it is to the correct forecast of the future movement of these latter that he directs his mind and energy.

This speculative forecasting of prices is a prolific source of changes in the purchasing policy of consumers and business men   If it is thought that prices are going to rise, there will be increased purchasing in the present, and a stocking

[2] This phenomenon of an exaggerated response in purchasing by business men in reacting to changes in demand for their merchandise was noticed by several authors See, e g., Hastings, pp 34-35, *loc. cit.*

up for the future. If the prices are expected to decline, buying will be checked and there will be a general tendency to dispose of the stocks carried at the present time

All this is so far a truism. But how is it that an expectation of a change in prices while causing the same kind of changes in the purchasing by all groups of economic individuals, will reflect itself in a small change in the purchases by ultimate consumers, a larger one in the buying by retailers, and a still larger one in purchases by wholesalers and manufacturers? Are there reasons to expect any difference in the amplitude of changes or fluctuations as between different branches of economic activity, when these changes are occasioned by a generally shared expectation of a certain future course of prices?

In the analysis of these reasons it would be advisable to take separately the relation of every two successive stages in the distributive system as follows· retailers' sales and retailers' purchases, wholesalers' sales and wholesalers' purchases; manufacturers' output and wholesalers' purchases.

The reason for expecting a change in retail sales to be smaller than that in retailers' purchases is, in brief, as follows. Purchases from retailers are made for the purpose of the immediate satisfaction of their wants by the ultimate consumers, while purchases from wholesalers (retailers' purchases) are made by business men for the purpose of reselling with profit.

Let it be supposed that there is an expectation of a rise of prices shared both by ultimate consumers and by retailers. Would one expect that the consumers will increase their purchases and buy ahead as heavily as will the retailers? They will not because they have neither the funds nor the time for doing that, nor the conveniences for storing goods, nor the same great stimulus as the retailers.

There is here the whole difference between a professional activity of anticipating changes in demand and supply, which is carried on by the retailer, and the amateur, subsidiary activity of the ultimate consumer when he or she goes out to buy the means of satisfying wants. The retailer is in the business of foreseeing just such changes of prices and of taking care of them If he needs to finance his legitimately increased purchases, he may gain access to bank funds or to open credit on the books of wholesalers Within reasonable limits he has the storage capacity for the additional stock. He is able to buy well and knows the source of merchandise. Above all, it is the center of his activity, the essence of his professional pursuit, and the motives of this pursuit are of a much more expanding nature than the immediate satisfaction of wants Take on the other hand the ultimate consumers They carry on their purchasing activity as a side-line either to some gainful occupation that takes the bulk of their time or to the activity of service in the home. They have neither funds ready for buying goods ahead, nor, in the conditions of the modern city apartment, any facilities for the appreciable storing of goods. Above all they have little time and incentive for such careful planning of purchasing activity in connection with expected price changes The average price of each item of their budget is not so supremely important to them, and purchasing ahead in a harmoniously planned fashion could hardly be expected. Except for rare cases, the ultimate consumer is never such an expert buyer as to know exactly the quality of the goods he is purchasing, and this fact would also restrain him from any considerable advance stocking or from buying goods in large amounts

We were assuming that the expectation of the price increase is shared both by retailers and ultimate consumers But except in the unusual case of an appreciable progressive inflation, in the ordinary course of business cycles the moments

are very rare when the consuming public is sure enough of a coming change to be able to act   There were such moments in the past five years, as, e.g., the case of shoes in July-August, 1919, articles of apparel in January, 1920.   At these times we did observe purchasing ahead and stocking by ultimate consumers.   But on the whole, such an expectancy is created in the consuming public only by rises in prices large enough to cause public consternation and become sensational.   Such is not to the case with the response of business men to coming price changes.   They are much more sensitive and the speculative forecast of prices is a much more active factor in causing fluctuations in their business activity *sui generis,* than in causing changes in the movement of purchases by ultimate consumers.

Indeed the demand of these latter seems to be best conceived as directed by the flow of purchasing power to the mass of consumers from the enterprises in which they are employed.   The cyclical fluctuations in this demand (whether measured in terms of commodities or in terms of dollar volume) are, then, a repercussion (Aftalion) of cyclical fluctuations in the volume of production and of trade.

An expected fall in prices would have the same difference in its effects on retail sales and retail purchases.   The ultimate consumers cannot very well stop buying, since they have no stocks of goods and many of their needs require regular, uniform satisfaction.   A retailer on the contrary can stop purchasing entirely for a time and still keep on selling his stocks.   Then there is again the same difference between these two groups of buyers as to the time and attention they devote to this matter of planning their purchasing activity.

The relation between changes in retail purchases and wholesalers' purchases is determined largely on the same basis as

the comparative changes in retail sales and retail purchases
The question now before us is as follows: Suppose that a
rise or decline in price of the merchandise is expected both
by retailers and wholesalers Are there any reasons to sup-
pose that the orders by wholesalers to manufacturers will
change more than the purchases by retailers from whole-
salers?

In an attempt to answer this question we can develop the
following arguments:

(1) In considering whether to act or not to act on the
expected price change, the business man must take into ac-
count not only the accretion of profit that he will enjoy from
making his purchasing policy follow the expected price move-
ment, but also the losses that he may incur thereby, and the
risk he is carrying in case the speculation goes wrong. If,
e.g., the expected price trend is a rising one, the purchase of
additional stock in the present increases his expenses by im-
posing a burden of carrying larger stocks for the time being,
and carries with it a risk, which increases with the increase
in the length of time it will take the buyer to dispose of his
additional volume of goods On the other hand, if prices seem
to be going down, the business man will probably refrain from
buying, which may result in the loss of potential customers
because of empty shelves, and with the risk that he may
overwait and have to order large quantities at prices already
higher. This cost side of the purchasing policy depends
largely on the length of time the buyer is to be burdened with
the results of his decision This must be considered when
our hypothetical business man decides on his commitments
under the influence of a speculative forecast of future prices.

It will be noted that this cost factor is different in the case
of retailers than in the case of the wholesalers The differ-
ence is in its turn a direct result of the different character
of demand presented by the groups which are buying from
the retailers and the wholesalers.

Because the retailers are selling to ultimate consumers, they cannot expect any fluctuations in their sales to take off the burden of the decision they may make about purchasing If a retailer decides to stock ahead, he knows that he will hardly be able to increase the physical volume of his sales very substantially even by offering prices somewhat lower than those on the market   If the retailer decides to abstain from buying, he may expect no substantial decline in the purchases from him by consumers, and he thus stands a good chance of running quickly out of stock. The even run of retail sales, and the slowness with which demand by consumers responds to prospective changes in prices, serve as a check upon any speculative attempts of the retailers in their purchasing, a check which works through increasing the cost and the risk of adjusting the stock policy very closely to the expected change in price.

The wholesalers are in a different situation, because they are selling not to the ultimate consumers but to the retailers who are themselves business men   A wholesaler may hope to dispose quickly of his surplus stocks by selling them at a price just below that existing on the market, a thing he will find very profitable if his forecast of prices turns out to be correct. He caters to a much more elastic demand than that catered to by the retailers, and thus has reason to be more daring in his purchasing policy than the latter. With a prospective increase of price he will purchase ahead more than the latter since he will be able to dispose of his stocks more quickly. With a prospective decrease in price, the wholesaler will be able to cut down his purchases more than the retailers, since the purchases from the former will decline much more than the purchases from the latter. Thus we see how the original difference between retail and wholesale sales serves itself as a factor tending to make for a similar difference in the amplitude of changes between retail and wholesale purchases. The close-knit system of sales and pur-

chases that characterizes the modern money economy is responsible for this transference.

(2) On the whole the average wholesaler seems to be more prepared and able to act either on the rise or on the fall than the average retailer. This statement would not apply to the big department stores and chain-store systems, which have a staff of special buyers well provided with all the information of the market and supplied with ample financial resources permitting expansion in case of need. But the argument would be true when applied to the mass of small retail dealers as compared with the mass of wholesalers The average wholesaler has better banking connections than the retail dealer, the latter depending in a large number of cases on the open book credits of the wholesalers themselves. The wholesaler stands also much nearer to the sources of merchandise, and is a greater expert than the retailer. It is an important fact that the routine part of the business, the selling, occupies a much larger part of the retailers' time and expenses than of the wholesalers By the nature of their business the retailers are, more than the wholesalers, mere technicians and have less time for speculative business activity. Hence retailers are likely to be less responsive to expected price changes even when they share the expectation in the same degree as do the wholesalers.

As a corollary it might be observed that the same change in price is likely to affect the profit margins of the wholesalers much more than those of the retailers The operating expenses in retail business are considerably larger than in the wholesale trades, forming about 25 per cent. of net sales in the former and 10 per cent in the latter. Thus the interest of the retailers would be more apt to be directed to the operating expenses side of business than would be the case with the wholesalers. A change of 9 per cent in the cost of merchandise will to the retailer mean a 6.75 per cent. change in the price charged (operating expenses remaining

stable), and if the net gain be 5 per cent. (counted for sim-
plicity into the operating expenses) the profits will increase
from 5 to 11.75 per cent., in case the merchandise was bought
before the rise in price took place   But the same kind of
buying ahead would increase the wholesaler's net profits from
5 to 13.1 per cent. (since the increase in the price charged
for the merchandise will be 9 multiplied by 9, operating ex-
penses being 10 per cent. and assumed stable).   We see that
with the same expected change in the price of the commodity,
the profits of the wholesalers will rise more than the profits
of the retailers.   There would be the same difference in effect
were a decline in prices assumed.

(3) During a rise of prices connected with a scarcity of
merchandise there is one other circumstance making for a
larger change in wholesale purchases, or rather orders, than
in retail purchases or orders   If there is one thing an estab-
lished retailer is afraid of, it is to remain without adequate
stocks and not to be able to satisfy the patrons   It is espe-
cially dreaded by the big retail houses which build up a
clientele by efficient service   Such a lack of goods and a
failure to supply the customers means to them not only loss
of potential current profits, but also a loss of prestige,
a damage to the name of the establishment which is hard
to repair.   If there is any prospective scarcity of goods the
retailer will hasten to cover up and to order in such a way
as to insure ample stocks   He will even order above his
actual needs and scatter his orders among different whole-
salers, each time marking the order somewhat above what
he actually desires to get, to insure the receipt of this latter
amount in case the order is only partially satisfied.   This
leads to what T. W. Mitchell called "competitive illusion," [3]
a situation where the wholesalers (and the manufacturers)
begin to receive increased orders and fall victims to the

[3] See his article, *Quarterly Journal of Economics*, Aug , 1924, pp
631-652.

illusory impression that this is an actual increase in demand, while it is only over-ordering done for fear the orders will not be fully and promptly executed

It is to be noted that this "competitive illusion" can hardly arise so as to deceive the retailers. The ultimate consumers buy the bulk of goods on the basis of immediate payment. They do not order the goods, nor do they practice cancellation of orders   True, the consumers may also create an "illusion" of an increase of demand, if, not being able to satisfy their demand in one place, they go to a second, and a third, leaving in all three the impression of an increased demand, and thus possibly giving rise to three new orders on the basis of only one unit of unsatisfied demand.   But this illusion can be created only in case the consumer could not satisfy his demand because of lack of goods and not because of too high prices.   Such cases are comparatively rare.

The system of orders by which the retailers indicate their demand has not such an irrevocable character as the system by which the ultimate consumer commits himself.   And going deeper into the question, one of the causes of it is that a certain time passes between the declaration of his demand by the retailer and its satisfaction by the wholesaler, a period of time which is much longer than in the satisfaction of the demand of ultimate consumers.   This lapse of time allows for risk and uncertainty and consequently for a certain looseness of the contractual relations entered into, which in its turn facilitates the appearance of a fictitious element, thus exaggerating the actual demand of one party, speculative as it already is.

To sum up, we developed above three arguments tending to show that in case a change in price is expected, the consequent change in purchasing will be greater with the wholesalers than with the retailers: (1) the different kinds of demand that the two groups of traders are satisfying by their sales, (2) the greater preparedness and ability of the wholesalers to adjust

their purchasing policy to expected changes of price, coupled with the fact that these price changes are liable to affect the net profits of wholesalers more than those of the retailers, (3) the danger of "competitive illusion," which is greater for the wholesaler than for the retailer (period of rising prices)

In drawing now the comparison between the purchasing by wholesalers and the manufacturing output by producers, we must first answer the question whether manufacturers go ahead with changes in output at their own risk or whether they follow in their activity the orders that come in. T. W Mitchell asserts that as a rule producers do not go ahead increasing their output without having orders on hand to . justify it.[4] Let us consider then two different cases one of a speculative producer who goes ahead with his manufacturing activity, and the second of a conservative producer who makes his output follow the flow of orders coming in

In the first case the arguments do not bear out any definite conclusion One might argue that the demand which is to be satisfied by the manufacturer is more elastic than that which is being supplied by the wholesaler, and hence the producer would be more likely to make a change in his output larger than the change made by the wholesale dealer. But on the other hand, the productive process takes a considerable time, and in reality no expectation of changing prices is certain enough to extend over the period of production in most of the branches of industry Thus though the demand to be satisfied is more elastic and the stocks probably be more capable of being quickly liquidated than those of the wholesalers, it would take a long time to procure the stocks, the expenses would already be laid out, and the risk would be great.

But is it not the same with the wholesaler? Does not he wait for his merchandise till the producer consummates the

4 See Hardy, "Risk and Risk Bearing," pp 634-636.

increased output? Yes, but only to a certain extent. First, the wholesaler may increase his stocks immediately by buying from the stocks in the hands of producers Second, the wholesaler even if he waits for the filling of his order, may cancel it if conditions change. Such cancellations were epidemic during 1920, and although resorted to with great reluctance, they are still providing an escape for the wholesaler. The manufacturer is committed to a far greater degree since all his costs of production are already expended.

The balance of these factors is uncertain If anything, one would suppose that in case the wholesalers got their increased stocks from sources other than the manufacturers themselves, the same expected rise in the price of merchandise would reflect itself much more in purchases by wholesalers than in a speculative increase of manufacturing output by the producers.

If one starts now with the more realistic assumption, namely, that the manufacturers are undertaking changes in their output only in accordance with changes in orders coming in, then an expected rise or fall in price will affect output only in so far as it will affect the purchasing policy of the wholesaler, and thus the volume of orders received There is still, however, a possibility that the change in output will be larger than the change in the volume of orders coming in.

This possibility arises when the change in the orders is continuing for some time in one direction If the increase or decrease of orders took place just once, then the corresponding change in output would be presumably equal to the change in orders. But suppose that it takes three months to get an increase in output, and orders increased during the first month 5 per cent, during the second month 10 per cent The total increase in the volume of unfilled orders at the end of the second month will be 15 per cent., which increases the pressure of demand upon the industrial enterprise. Such piling up of unfilled orders might lead to an increase in

output not justified by the month-to-month changes in volume of new orders coming in. The same cumulative influence will be exercised by a diminution of orders coming in, and the output might be reduced too low in accordance with the rapid decrease in the volume of unfilled orders. Whether this latter measure does influence the planning of future output is open to doubt.

We have considered so far two big factors that influence the purchasing policy of retailers, wholesalers, consumers, and the production plans of manufacturers: (1) an expected change in sales, (2) an expected change in price of the merchandise. But speaking of the two groups of traders, the price of merchandise, although it forms the bulk of the cost, does not cover all of it. There are also the operating expenses. Among these there is one item of great interest · the charges for credit accommodation.

We need not speak of the part played by the ease or stringency of credit supply in the case of the ultimate consumer. The change in the bank rate or rationing of loans has scarcely any direct effect on his purchasing policy. He does not resort to banks to finance his consumption purchases. But the interest rate and credit conditions play a definite rôle in the purchasing activity of retailers and wholesalers

As a pure cost item, the importance of the rate on short-term loans is determined by its weight among the other cost items, and by the size of the margins that are allowed for net profit. But it must be noted that this importance becomes real only if the retailer or the wholesaler finds it necessary to resort to loans to subsidize his purchases. If he uses his own funds for this purpose, it is another interest rate that enters as "opportunity cost," the rate that could be obtained from investing the available funds somewhere else

In their bearing as cost items, the changes in interest rate are of much greater importance for the wholesalers than for

the retailers. The bulk of the latter do not enjoy any appreciable credit advances from banks and borrow mostly from the wholesalers or manufacturers who supply them with merchandise. It is thus only indirectly that the influence of the bank rate makes itself felt in the purchases by retailers. To this it must be added that interest charges form a much smaller percentage of the operating expenses of retail stores than of the operating expenses of wholesale firms.

Thus if changes in bank rate are recognized as one of the elements in the movement of business through the stages of the cycle, the reflection of these changes will be stronger in the purchasing by the wholesalers than in that by the retailers, and stronger in this latter than in the buying by ultimate consumers. In its direct effect this factor leads also to the expectation of the same difference in the amplitude of fluctuations stated above.

Its importance as a cost item is not the only way through which the interest rate and changes in banking policy affect the purchasing policy of business men There might be a complete cutting off of credits in time of over-expansion There might be the indirect psychological influence through the influence of the banking policy on the stock exchange activity Or it might change the situation by stimulating the construction industries and thus making for a change in consumers' demand through increased disbursement of wages and salaries. In any of those cases, however, we observe again the greater susceptibility to any changes in the business conjuncture of wholesale purchases as compared to retail, of retail as compared to those by consumers.

The arguments that were developed might have produced the impression that we conceive the retailers, wholesalers, and consumers as rational beings calculating coldly and closely all pros and cons and deciding on their purchases in accordance with the way that we have laid out for them. It is

well to state emphatically that this is not the case. What
the arguments imply is that this or that condition in the
business man's activity make for a tendency on his part to
act in this or that definite way. When we said that the whole-
saler satisfied a demand more elastic than that catered to by
the retailer, we did not mean that every time he plunges
ahead, he has such a consideration in his mind   But this
factor is present in the conditions of his work and may be
supposed to have resulted in a creation of a certain habit
on the part of the wholesaler, that would make him more
daring than the retailer   Similarly, if we analyze every
argument brought out above we shall find that each of them
forms a short description of a peculiar condition in which
the economic activity of the discussed group of business men
is carried on, a condition that would in the long run result
in peculiar habits of activity, patterns of action differing with
the various groups in the successive stages of the distributive
system

    This, however, does not mean that the irrational elements
are taken care of   These might enter, and of their influence,
and of the way they might prevent the working out of the
actual counterparts of the hypothetical case we can say
nothing   Here the irrational covers the dark region of the
unknown   However, we could lift out one irrational element
in the business men's activity which has definite contours.

    Some of the theories of business cycles stress the importance
of the "moods in the business world," conceiving the fluctua-
tions in economic activity mainly as a regular succession of
the feelings of optimism and pessimism that are conceived in
one place and then spread as a contagious sickness gripping
all the business community in its sway   We have thus a
change of mood which introduces elements other than pure
calculations, or even habits based on the assumption of best
adjustment.

    It is to be seen that these fluctuations in psychological

attitude are less common and potent in the case of the large body of the consuming public than in that of the retailers, much less in the case of the retailers than in that of the closer-knit community of wholesalers It is a matter of common knowledge that such well-defined changes in the attitude to purchases and spending of money as were observed in 1919 are comparatively rare And it takes only such a well-defined change in the mood to make for the spread of this new feeling from one consumer to another, resulting in a kind of psychological infection. The group of retailers is smaller and more homogeneous than the body of ultimate consumers, more tied together by common sources of supply and by similar activity. One thus might expect that the formation of a common attitude would be much easier there, and would be produced by changes comparatively less fundamental than those that are required to make for a change in the mood of the consuming public. Similarly, the wholesalers forming a much smaller group and a more closely knit market are still more susceptible to these waves of emotional outlook and attitude.

Besides the size of the group and the degree to which it is knit together, the element of uncertainty determines the place left to such emotional contagion The more risky and uncertain one's activity, the more place will probably be allowed for the irrational elements And since the element of risk and uncertainty is larger with the retailer in his purchases than with the consumer, with the wholesaler than with the retailer, one would again conclude that changes coming from this spreading of moods would affect more the purchasing of the wholesaler, less that of the retailer, still less that of the ultimate consumer.

II

We surveyed four factors affecting the purchasing policy of business men and of consumers and showed in every case,

that one and the same change in the determining factor will reflect itself in changes of different magnitude in the purchasing by different groups of economic individuals But the question is now whether the influences of these factors do not neutralize each other, so that instead of an explanation of fluctuations we might really presuppose an even run of business activity. The problem before us now is to weave the influence of all these factors together so as to present a schematic description of the cyclical fluctuations in economic activity.

Before we embark on this project it would be well to have in mind exactly the point at which we aim. It is to be seen that if there is continuous, sustained change in one direction in the purchasing activity of the various groups of economic individuals, there will be also a continuous difference in the volume of this change in the different stages of the distributive process. If there is a sustained increase in purchasing called for by the influence of the factors discussed above, the sales by retailers will increase the least, the sales by wholesalers more, sales by manufacturers or output still more. But that would mean that there will be also a gradual accumulation of stocks with retailers and with wholesalers The formation and existence of these stocks become in their turn the most important factors determining future purchasing, factors that put a check to movement of increase and that determine that in the consequent process of decline there will be observed the same difference in decline as was present during the rise. This stock factor is the one which will help to explain how the cyclical swing comes about, how one of its periods follows necessarily the other one.[5] But we must first of all investigate the conditions of a sustained, consistent movement of business activity in one direction which makes for this cumulative influence on stocks.

For the purpose of beginning this investigation we must

[5] See Lawrence K Frank, Q. J. of E., August, 1923, pp. 625-642.

assume the initial change as given. Let us say it is an increase
in prices (expected) or an expected increase in demand. We
could assume that this initial change is continuous through-
out a long period of time, but that would mean throwing away
the burden of explanation   It may better be supposed that
the initial change is short and small   Under what conditions
will such a change start a continuous period of rise or fall
and how will the latter be brought about?

Since a change in the activity of economic individuals is
a resultant of the sum total of the several factors affecting
it, a change in one of the latter will have a definite effect only
if supplemented by all the others. Thus, if the demand by
consumers from the retailers increases, it will not produce any
. change in purchasing by retailers if the stocks are large, if
the dealers expect a fall in prices, if the credit conditions are
bad, and if there is a panicky feeling on the other markets.
And similarly an expected rise in prices would be ineffective
if paralleled by the existence of large stocks, by an expected
decline in demand, or by tight credit conditions.

To have an effect on the purchasing policy of a given
group of economic individuals the initial change must be
either large enough to overcome the neutralizing influence
of other factors, or to be favored by them. But this is true
not only in producing an effect on the group of business men
with whom the change starts, but also in order to transmit
the effects of this change. Thus even when the retailers do
increase or decrease the purchasing under the influence of
a change in one or in several of their factor-determinants,
there is again a new set of barriers (or favoring circum-
stances) which might prevent (or further) any influence that
the change in purchasing by the retailers might exercise on
the purchasing by the wholesalers. And again a new set of
factors is to be considered in the process of transmitting the
initial change or rather its effects from the wholesalers to
the manufacturers.

This consideration of the early effects of the initial change assumed is of critical importance, since it is only by reaching the sources of production and through affecting the volume of output that the initial change becomes self-perpetuating. If the initial change in price or demand makes for an increased production, it is fairly probable that it will keep up the increase in price and business activity. Since, on one hand, the existence of a demand which cannot be satisfied immediately from the existing stocks and which has to wait for its satisfaction through the period it takes to produce the new supply, is likely in itself to increase the demand because of the prospective difficulty of obtaining goods On the other hand, increased output in factories means increased disbursement of wages and salaries This results in an increased demand by ultimate consumers which gives a new impetus to the process of rise.

It is thus seen that the initial change in order to have a fair chance of perpetuating itself and thus incepting a continuous process of rise must be a combination of several favoring factors The difficulty of starting with such a vast body of assumptions at once is avoided by the theorists of business cycles by assuming at the start the conditions of a trough of depression. There is a point at which the needed combination of favoring circumstances is brought about by those forces of economic life which during the period of decline work for the resumption of a new period of prosperity Is such an assumption legitimate? Do we not then include in the initial suppositions a large part of what really ought to be explained?

The procedure becomes largely justified when the exposition starting with the assumption described above goes on and proves how in the process of business development the period of prosperity that unfolds itself after the trough of depression turns inevitably into depression, and comes back again

to the low point from which it started. We address ourselves now to just such a tentative exposition.

In ascertaining the way in which an initial change will affect purchasing policy and be transmitted from one branch of business activity to another, we note that the change (increase) may perpetuate itself through the two following processes:

(1) With an increase in price formed by the initial change, this rise will spread to commodities related to the goods which first changed in price This relation may be a productive one, i e , determined by the use of this other commodity in the process of production of the other, or the commodities .may have bonds of kinship because of competitive use in consumption This spread of the initial price rise will by itself constitute an additional stimulus to further increase of purchasing, since the present movement of prices is one of the most widely used means of forecasting the future movement. Beginning with low stocks, ample supply of means of payment, or after a long period of price decline or stability at low levels, this initial rise of prices will perpetuate itself by forming a stimulus for further commitments. One must also take into account that such a rise affects considerably the net gains of traders and of manufacturers since their costs do not increase as quickly. In the beginning of a period of revival or prosperity, an initial improvement in price tends to augment itself by forming a psychological stimulus for expanding the purchases.

(2) But this rise would not keep up for very long, if the increased demand for commodities could be supplied quickly and without any increase in the volume of purchasing power distributed to the vast consuming public It is when stocks are becoming exhausted and the orders of wholesalers and retailers must wait for their filling, that the prospect of

scarcity of goods becomes potent in driving up the volume of orders and purchases   It is at this moment that the ''competitive illusion'' is adding on fictitious elements which make the demand of one group greatly exaggerated as seen by the group directly above in the distributive system.   It is probably at this moment that the contagious feeling of buoyancy, supreme assurance about the future high course of prices, and a certain recklessness is becoming general in the business community.   Prices are being driven up high, production hurried, and the cumulation of unfilled orders may make for expansion of production beyond the actual needs.

The increase in manufacturing output starts probably with the first initial change in demand by retailers and wholesalers, but this does not mean an immediate rise in volume of wages · and salaries disbursed.   There is presumably a certain elasticity in the amount of output that can be produced with the same amount of labor power employed.   But beyond a certain point new workers must be engaged or the old ones employed overtime.   This has a double effect: it first serves to raise the volume of wages and eventually to raise the wage rates as well.

The increase of wage and salary disbursements reflects itself almost immediately in an increased demand from retail stores. This supplies fresh impetus to increased purchasing and the period of expansion becomes continuous and self-perpetuating

It must be noted here that the increase in wage disbursements connected with a given increase in output appears on the market considerably earlier than the additional amount of the finished product itself.   If it takes three months to bring a commodity to the point where it is ready for sales to immediate consumers, and an increase was started in the month of June, the first increased wage disbursements will be made in the first week of June, while the additional supply of commodities will appear on the market only in the end of

August. That means that if we consider every good appearing on the market as increasing the equation on the side of supply by exactly the same amount by which it is augmented on the side of demand, we must take into account the considerable lapse of time between the two increases. This intervention of a period of time would not be important if a static condition were assumed, i e., if year in, year out, the same amount of output were produced, the same volume of wages and salaries disbursed But when a change is allowed for, this lapse of time between the paying out of costs and the delivery of the finished goods to the market results in an appearance for a time of a change in demand apparently not neutralized by any change in supply.

· This factor would appear both during prosperity and during depression, whenever changes in output are undertaken that have as a result a change in the volume of purchasing power disbursed In both cases, on the rise and on the decline it has the effect of magnifying for the time being the influence of the conditions that are responsible for the contemplated and consummated change in the volume of goods produced. Thus in the period of rising prices, the speculative demand by retailers and wholesalers is stimulated not only by the prospect of scarcity of goods and of having to await the filling of orders, but also by the improved demand that comes from the vast body of consumers who enjoy better wages. Prices rise, orders to manufacturers increase.

In this way a process of continuous rise may develop from an initial rise in prices or a change in any other factors making for an expansion of purchasing activity, provided all other factors favor such a rise. Once started it may first perpetuate itself by becoming itself a stimulus for further commitments Then if it necessitates an increased volume of production, it is fairly likely to lead again to increased demand and purchasing, because of the temporary scarcity

of goods in face of a resulting increase in the volume of purchasing power distributed to the consuming public [6]

Why does not the period of prosperity go on forever? If the initial change once started under favorable conditions perpetuates itself in magnified dimensions, what prevents the cumulation from going on for a period indefinitely long? This problem of the economic forces which during prosperity breed depression is discussed at length elsewhere.[7] In the present context the question will be taken up only by applying the specific fact of the difference in the amplitude of fluctuations between different branches of business activity, the arguments for the explanation of which were advanced above.

The schematic description of the period of ''prosperity'' shows that all the factors determining purchasing policy work together, i e., they all with the possible exception of one undergo changes of the same character. While the rise of prices is expected, the demand by consumers begins also to increase after a certain time has passed from the beginning of the upward movement The psychological factor is hardly an independent one and thus goes together usually with the other changes It is only the conditions of credit supply that after a certain time begin to work as a neutralizing check upon the effect of the others. But on the whole it might be presumed that while the increase is on, for reasons stated at

[6] In 1919 there was an enlightening illustration of how these two phases of the period of increase did not connect themselves, and a break intervened between the one and the other Thus prices and demand by retailers were rising from March, 1919, to July, 1919, reaching a very high point in this latter month But then a break came. In August and September both prices and sales by wholesalers showed a decline. The reason for this break was in the fact that demand by ultimate consumers (retail sales) was declining on the whole up to May, and that the demand by retailers seemed to have been easily satisfied. But with second rise in October, 1919-January, 1920, there was decidedly the trouble with getting production working at the pace required by the demand of retailers and wholesalers Also increased wage disbursements were reflecting themselves in a very much improved demand by ultimate consumers.

[7] See W. C. Mitchell, ''Business Cycles,'' Chap. XI, pp. 475-512.

length above, the same rise in prices and increase in demand are going to result in an expansion of wholesale purchases larger than that in retail purchases, and these in turn larger than purchases by ultimate consumers This is also the general conclusion from the data analyzed at length in the first chapters, although the series covered a rather short time.

This difference in the degree of rise in the volume of business activity in the different stages of the distributive system has an implication already touched upon above As the period of prosperity is developing more and more, there are more and more stocks left unsold with the retailers and with the wholesalers It is this cumulation of stocks that seems to be one of the most important factors in terminating · the period of rise.

It is certainly not the only factor As W. C. Mitchell points out, there are also (a) the tension in the credit market, (b) the easier supply of goods with the factories beginning to deliver the finished goods according to the orders, (c) the increased costs of doing business, and many others [8] It is again a combination of all the factors which were mentioned as determining the purchasing policy of business men (the size of stocks included).

The forces mentioned above are at work during the period of prosperity, and change gradually the alignment of factors that determine the purchasing policy of business men There comes a time when these changes become considerable enough

[8] In his book, "Business Cycles," Professor W C Mitchell, speaking of underconsumption as the probable determining factor in preventing a rise of prices at the peak of prosperity and thus in terminating this latter period, notes that there seem to be no quantitative proof of such a hypothesis, and that the comparison of movements in the production of producers' goods and output of consumers' goods would make against recognizing this factor as operative (see pp 499-502) Although the data cited above would support no "underconsumption" theory in the form in which it is usually stated, they do show that consumers' demand does not rise as much as retailers' demand This making for accumulation of stocks serves undoubtedly to check the further advance of prices .   The fact that retail sales continued to decline later than

to effect a modification in the purchasing policy and make for an initial decline in new commitments. What makes this initial decline continuous? How does it happen that a drawn-out process of depression develops?

In attempting to answer this question we need not be very explicit, since the same forces which were converting the initial rise in demand and prices into a continuous one are now exercising their influence to perpetuate the initial decline into a cumulative process of depression.

It was noted above that we had to assume a whole combination of states of factors as given, which would permit or favor an initial rise in price to develop into a continuous process of rise In the present case there is no need of assuming this series of favorable factors-conditions: they are given as the outcome of the period of prosperity. To wit, the stocks are large, the interest rate is high, in some of the branches of retail trade the physical volume of sales has begun to diminish, the consistent rise of prices in the past creates an attitude of apprehension on the part of business men. In these conditions an initial change in the purchasing policy with its first effect on prices will rather likely become itself a stimulus for continued change, just as in the beginning of the period of prosperity the starting rise in prices served itself as a stimulus to a further increase in demand

But here again this decline would not continue for long, if it does not reach production and there reflect itself in a

wholesale sales would not form a serious objection against this assertion Since stocks are cumulating all through the period of prosperity, and the movement of demand is not recognized as the only factor influencing purchasing policy   .   On the other hand, the earlier decline in the output of producers' goods as compared with the production of consumers' goods seems to be adequately explained by: (1) the hypothesis presented above, quoted from J M Clark's book, (2) the fact that public utilities cannot adjust their rates as well as the private enterprises and thus their net earnings tend to decline through the largest part of the period of prosperity. But at the same time the demand by public utilities forms a large part of the demand for producers' goods.

decrease in the volume of purchasing power disbursed to the employees. That happens with a certain lag, and then it results in a decrease in the volume of retail sales, especially these branches of it that are largely affected by working-men's demand   This decline in sales makes the retailers expect a further decline, and they reduce their purchases still more   Thus the initial decline gets protracted into a longer depression

In this period of decline the purchases by ultimate consumers tend to decrease the least, the purchases by retailers decline more, those by wholesalers still more   Thus the period of depression is a period of gradual liquidation of stocks all along the line, just as the period of prosperity was the time of accumulation of stocks by business men. And to the extent that the stocks are carried with the assistance of credit granted by the banks, the period of depression means a gradual liquidation of obligations with a corresponding decrease in the volume of loans and discounts outstanding.

Is it necessarily true that at the end of the period of depression we shall have the same set of circumstances which we assumed as given at the starting point of our description? Why is it that business men do not stop reducing their purchases when they have "normal" stocks? Or why is it that the volume of credit outstanding declines so far? Why does not the whole process of decline stop at some point termed normal, but develops further into the dark-colored regions of "sub-normal" and there gives rise to a repetition of the whole cycle?

This question which seems at first sight very puzzling, is, however, largely meaningless since it is based on a misleading concept of "normal" and "abnormal." Normal is not a given point and quantity determined without any connection with the fluctuations about it. Statistically and conceptually a normal is determined by the fluctuations about it, and in such a way as to make possible the measurement

of these fluctuations separated from elements that are not to be considered for the purposes of a study of the cycles problem. Once it is recognized that a decline follows a preceding period of rise, there is necessarily created a condition of "low" as compared with the preceding "high," although measured in absolute terms the "low" may be larger than the "high " In a long series covering an appreciable number of completed cycles, some individual business cycles may show a decline which just touches the line of "normal" and then gives place to another period of revival and prosperity. Likewise, some individual cycle may have the curve of prosperity just reaching the line of "normal" and then starting to decline, so that the period of rise is not the period of activity "above normal " This, however, can happen only to · an individual cycle or two, since by the nature of the procedure that is followed in fitting the line of "normal" to a time series there must be "high" and "low" points distributed more or less evenly around the line fitted It is clear that conceptually "high," "low," or "normal" are relative terms, and since normal is determined by the high and the low, the mere granting of a cessation in the rise involves a recognition of a "low" point as following in time sequence the "high" one

But these concepts are even more realistic than that. For many phenomena, like the prices of his merchandise, the volume of his sales, the volume of stocks, price of credit accommodation, the business man's conception of high and low does not differ materially from the corresponding purely statistical conception In the statistical analysis the line of normal is supposed to represent the line of long-time growth combined with the regular seasonal variations When the business man speaks of his stocks or of his sales or of the prices (for the latter it is not so sure) as "ordinary" or "usual for the season," he seems to think roughly of what the line of the secular trend adjusted for the seasonal varia-

tions would tell him   On the other hand, the factor of "good" and "bad" times is not regular enough to create in the business man a concept of "usual" for the state of times, since the latter cannot be forecast and known definitely as the seasonal fluctuations, nor is it as long as the long-time growth and thus cannot become rooted in the perception of the individual   So that speaking of "high" and "low" sales or stocks the business man seems to imply approximately the same that is described by a low or high point in a well-analyzed statistical series of stocks and sales when adjusted for the secular trend and the seasonal variations

Consequently, the question posited above, as to why stocks become "abnormally" low as a result of processes in force during the period of depression answers itself to a large extent.   Granted that a decline must come after the period of prosperity reaches a certain point, that in this decline business activity in the different stages of the distributive process declines in volume at different rates; that this difference in the amplitude of fluctuations must mean a decline in the volume of stocks, granted further that there are forces at hand which make the decrease in the rate of business activity more or less continuous, with the result that the decline in the volume of stocks becomes a protracted process—then the fact that a condition of "low" stocks must be arrived at is self-evident.

This reasoning applies not only to stocks, but to sales, credit conditions, and other factors determining the purchasing of business men   Thus at the end of the period of depression, with the stocks low, the volume of credit outstanding small and the rate of interest consequently low, with the process of price decline having gone on for an appreciably long time, we observe again a combination of factors favorable for the start of a new period of revival.   True, the retail sales may yet be declining, but the rate of decline will be probably smaller and then we may have increased purchasing in spite

of decreasing retail sales [9] On the other hand, it may so happen that the renewed demand for construction and other producers' goods may be stimulated early by low prices and the increased net earnings of the public utility corporations, which in its turn would mean better employment and larger retail sales Whatever the run of retail sales may be, it is here again a question of the combined effect of all the factors, and the influence of small stocks and prospective rise of prices may be large enough to be in themselves responsible for a new rise The important thing to note, however, is that at the end of the period of depression we arrive at a situation exactly similar to that with which we started, namely, a combination of conditions which makes it probable that an occasional change in the circumstances making for an initial . rise of prices will be perpetuated and magnified into a new, continuous period of prosperity

But must we always have a random change coming to the rescue ? Can we not suppose that without any interference of accidental circumstances the developments of the period of depression will come to a certain critical point and then the curve of business activity will turn upwards? If we cannot do that, if we need every time at the start of a new cycle some new accidental change, do we not throw the force of the explanation away, since the question arises: How do these accidental changes occur so as to be at hand every time a new period of revival and prosperity is to begin?

Nearly every turn in business activity may be identified with a certain single event or group of events In this sense there must always be an accidental change which terminates a period of depression and starts a period of revival or prosperity. But to say that this accidental change is in any way the cause of the whole up-grade movement, to make the appearance of the latter dependent upon the occurrence of this accidental event would involve a misrepresentation.

[9] See the arithmetical illustration above, p. 165.

It is the combination of this occurrence with the fact that all other conditions favor such a change that starts off a new period in the fluctuations of business activity.

This does not mean that the random events have no influence on the relative changes in the volume of business activity. An absence of any appreciable accidental occurrences might delay the change from depression to revival because of the inertia and momentum of the movement. An appreciable accidental event which would favor more extensive purchasing might cut short a period of depression, just as an occurrence of an opposite character might prolong it   It is evidently to this reason that a large part of the irregularities in cyclical fluctuations are due. But since the action of accidental events is conditioned by the factors listed above which determine the purchasing by business men and which make in their varying influence on the different groups a cyclical swing, it can nowise be said that the change from one phase to another is bound only with an appearance of accidental changes, which must then appear uniformly in time to generate the cyclical movement. It might be conceived that these random elements are entering nearly always and stirring up the situation, thus giving impulse to action in which the resultant of all the factors-conditions present at that particular moment is manifesting itself. That, however, must be left an open question since we have no data to support the hypothesis.

We are at the end of our hypothetical scheme of the processes that might account for the cyclical fluctuations which are observable in modern economic life. Starting with an initial condition similar to that existing at the end of a period of depression, we built up a conjectural description, in which were used two kinds of arguments: the price and production kinship of different enterprises as making for protracted periods of rise and fall, and the difference in the

amplitude of fluctuations at different stages of the distributive system as one of the main factors responsible for the changes from one period to another and for periodical repetition of the cycle.

The description given above is by no means an attempt to give a complete theory of business cycles. It is a sketch which was made to show the place of just one factor, of the difference in the amplitude of fluctuations in the various branches of business activity In conjunction with other factors which made for the continuity of the first period of change, this difference in the amplitude of fluctuations was shown to have resulted in a certain change in stocks and thus to have terminated the rise and made for the coming of the decline The same combination of factors accounted for the continuity of the decline, and the movements of the same stocks, only in an opposite direction, and made the field ready for a new period of rise. But it goes without saying, that this description does not exclude other possible explanations by bringing in other factors It leaves out entirely the question of ''generating'' causes. It is a hypothesis limited in its inductive basis The data presented offer very little ground for a valid general induction. The arguments offered in the last two chapters were not tested by any actual study of economic behavior.

It is to be observed that the peculiar feature of the scheme described is in the lack of an adjustment mechanism for the two groups of forces which are presented as exercising their influence in the economic processes of the modern money economy. One group of forces consisted of those that made for an exaggeration and perpetuation of any change given. These were the factors of illusion created by competition, of the magnifying influence of a common psychological mood entertained by the business community, the system of stocks, and equipment. They all worked through the close technical and price interrelationship, that were presented as binding the legally independent business enterprises into a system. In

this latter the shock in one place was thus likely to rebound in another and set up a continuous vibration. The second group of forces was composed of those making for stability. They served to keep down the effects of a given change, and their resistance seemed to progress as the change became greater, or especially if this latter had accelerated. Those were the forces of the stable demand of the ultimate consumers, the elements of stability in the carrying of stock which set limits to the change that could take place there, and finally the conservative forces in the conditions of credit supply. The latter were the most conspicuous in the eyes of the observers because they were apparently under the control of the consciously directed will of a certain class of individuals.

If these two groups of forces would react to a given change in such a way that one would cancel the effect of the other, the change would produce an effect just commensurate with its own size. A small, accidental variation would not be able to start a continuous period of rise or fall. But, as the scheme presented has shown, it was enough to put the system out of balance just once, i.e , to produce the first protracted change, and through the mechanism of reaction the two groups of forces did not regain the position of balance. With this lack of balance, a state of factors at the low point of depression leads easily into prosperity and then again to the starting point, thus ready for a new cyclical movement.

Thus, so far as the scheme goes, cyclical fluctuations are largely accounted for in terms of an absence of balance between the two groups of forces in modern money economy. But to repeat, the scheme does not pretend to set up an exhaustive explanation of the problem of the business cycle. It attempts to develop fully only one of the peculiarities of the modern economic system and leaves an open field for other supplementary explanations and accounts.